ENVIROSCAN, INC.

Final Report
Geophysical Survey
Utility/Structure Clearance, Approximately 20 Boring Locations
Metallic Debris Detection/Delineation, Approximately 14-Acre Area
DuPont Automotive Products
Toledo, OH
Enviroscan Project Number 090305

Prepared For: URS-WC Diamond
Prepared By: Enviroscan, Inc.
October 29, 2003

MARINE SEARCH AND SURVEY

a division of ENVIROSCAN, INC.

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ENVIROSCAN, INC.

October 29, 2003

Mr. Larry T. Reitz
URS-WC Diamond
Barley Mill Plaza
Building 27
Wilmington, DE 19880-0027

RE: Geophysical Survey
Utility/Structure Clearance, Approximately 20 Boring Locations
Metallic Debris Detection/Delineation, Approximately 14-Acre Area
DuPont Automotive Products
Toledo, OH
Enviroscan Project Number 090305

Dear Mr. Reitz:

Pursuant to our proposal dated September 5, 2003, Enviroscan, Inc., has completed a multi-technique geophysical survey of the above-referenced site. The following report and figures detail the methods and results of the survey.

Background and Purpose

The site is occupied by a Dupont Automotive Parts Facility that produces resins for the automotive industry. Historically, this plant also produced paint for use in the automotive industry. The purposes of the survey were to provide detection and tracing of various infrastructure elements, as well as suspected buried disposal areas. Specifically, the geophysical survey was intended to:

1) provide utility clearance for approximately 23 proposed borings or geoprobes,

2) delineate suspected disposal trenches, landfills and/or drum caches within the plant property, outside the areas previously surveyed during a previous geophysical investigation (Enviroscan Project Number 090204).

Methods

In order to satisfy the survey purposes, Enviroscan completed a multi-technique geophysical survey on October 7 and 8, 2003. The principles, methods, and results for each survey technique are detailed below.

Boring Clearance

The utility survey was completed using standard and/or routinely accepted practices of the geophysical industry and equipment representing the best available technology, including:

- a Fisher TW-6 electromagnetic (EM) pipe and cable locator/tracer;
- a Fisher FX-3 magnetic (MAG) locator;
- a Radiodetection C.A.T. and Genny pipe and cable locator/tracer;
- a Radiodetection RD4000 Multi-Frequency pipe and cable tracer; and
- a GSSI SIR-2000 ground penetrating radar (GPR) system.

The approximate location of each proposed boring was indicated on a map supplied by the client. At each proposed boring location, Enviroscan selected the center for the 10-foot diameter survey area such that an on-site drill rig could access the entire area of interest. Enviroscan then conducted utility/structure clearance within each survey area, using the instruments described below. Following scanning in each area, Enviroscan indicated a location that appeared to be free of metallic and nonmetallic anomalies.

TW-6

In order to detect and trace underground utilities, Enviroscan employed a Fisher TW-6 pipe and cable locator/tracer. In pipe and cable search mode, the TW-6 is essentially a deep-sensing metal detector that detects any highly electrically conductive materials (e.g. metals) by creating an electromagnetic field with a transmitting coil. A receiving coil at a fixed separation from the transmitter measures the field strength. As the instrument is swept along the ground surface, subsurface metallic bodies distort the transmitted field. The change in field strength/orientation is sensed by the receiver, setting off an audible alarm and causing deflection of an analog meter. The TW-6 can nominally detect a 2-inch metal pipe to a depth of 8 feet and a 10-inch metal pipe to a depth of 14 feet.

In pipe and cable tracing mode, the TW-6 transmitter can be coupled directly (conductively) to exposed portions of a metallic pipe, cable, or wire, or inductively to a subsurface metallic utility with known location and orientation. The transmitter remains stationary and energizes or excites the metallic utility to be traced with an 81.92-kilohertz signal that can be traced at the ground surface using the mobile TW-6 receiver wand or probe. In addition, approximate depths to metallic utilities can be determined using inductive or conductive mode triangulation.

C.A.T. and Genny

The survey areas were also scanned with a Radiodetection C.A.T. and Genny pipe and cable locator and tracer. In Power mode, the C.A.T. detects the 50 to 60 Hertz (Hz) electromagnetic field generated by live power cables and other metallic utilities to which a live line is grounded. In Radio mode, the C.A.T. detects buried conductors (cables or metallic pipes) as they conduct and re-transmit commercial broadcast radio energy. In Genny mode, the C.A.T. detects signal generated by the Genny transmitter. The Genny transmitter can be coupled directly (conductively) to exposed portions of a metallic pipe, cable, or wire or inductively to a subsurface metallic utility with known location and orientation. In addition, the C.A.T. can be used to track a miniature, waterproof sonde or "mole" inserted into any accessible pipe by a variety of means – including floating it down a fluid-filled pipe (often called "pigging"), pushing it through the pipe with flexible fiberglass rods (typically limited to approximately 200 feet of insertion), or hand-carrying it through an evacuated pipe (with proper confined space entry controls).

RD4000

Utility tracing was also conducted using a Radiodetection RD4000 digital cable and pipe tracer and transmitter. Similar to the TW-6 and C.A.T./Genny, the transmitter can be directly coupled to exposed portions of a metallic pipe, cable, or wire or indirectly (inductively) to a subsurface metallic utility of known location/orientation. The transmitter remains stationary and energizes the metallic utility at a frequency selected by the operator (512 Hz, 8 kHz, 33 kHz, or 65 kHz), which is received at the ground surface by the RD4000 receiver. When the transmitter is coupled directly to the metallic utility, the RD4000 digital receiver can also calculate the depth of the utility to an accuracy of $\pm$10% of the actual depth of the utility. Please note the close proximity to bends in the traced line or poor signal strength can result in erroneous depth estimations. The RD4000 can also trace a "mole" in the same fashion as the C.A.T., as described above.

FX-3

Enviroscan also employed a Fisher FX-3 magnetic locator. The FX-3 contains two sensors that measure the difference in total strength of the earth's magnetic field between two fixed heights above the ground surface (i.e. the magnetic gradient). In the absence of artificial magnetic fields or buried ferromagnetic objects, the natural gradient of the earth's field is relatively constant. Where buried magnetic or ferromagnetic objects (e.g. magnetite or iron respectively) are present, the gradient varies rapidly as the instrument is swept along the ground surface, triggering an audible alarm. The MAG instrument employed for this survey can nominally detect a 2-inch steel pipe to a depth of 4 feet.

GPR

GPR systems produce cross-sectional images of subsurface features and layers by continuously emitting pulses of radar frequency energy from a scanning antenna as it is towed along a survey profile. The radar pulses are reflected by interfaces between materials with differing dielectric properties. The reflections return to the antenna and are displayed on a video monitor as a continuous cross section in real time. Since the electrical properties of metal are distinctly different from soil and backfill materials, metallic pipes and other structures commonly produce dramatic and characteristic reflections. Fiberglass, plastic, concrete, and terra-cotta pipes and structures also produce recognizable, but less dramatic reflections. Scanning was performed using a GSSI SIR-2000 GPR controller with an internal hard drive and a color display, and both a high-frequency, high-resolution 500 megaHertz (MHz) antenna or transducer, and a lower frequency, deep-penetrating 200 MHz transducer.

Please note that onsite testing indicated that GPR penetration depth was severely limited over most of the site due to metallic reinforcing in the numerous concrete pads, as well as possibly electrically conductive soils and/or fill material underlying the site. In certain cases, GPR was of limited use in the tracing of utilities with a known orientation.

Detection of Disposal Trenches, Landfills and/or Drum Caches

EM

Enviroscan performed mapping of subsurface metallic masses using a Geonics EM-61 instrument. The EM-61 uses a one-meter by ½-meter coil to transmit 150 electromagnetic pulses per second into the ground at each measurement station. A second transmitter coil is used to narrowly focus the pulses, making the instrument relatively insensitive to overhead and/or nearby sources of electromagnetic interference such as buildings, fences, power lines, surficial debris, and atmospheric electromagnetic activity. During the off-time between transmitted pulses, a receiver coil measures the decay of transient electrical currents induced by the transmitted pulses. Electrical currents in moderately conductive earth materials (e.g. electrolytic soils) dissipate rapidly, leaving the more prolonged currents due to buried metallic objects. The EM-61 measures the surficial electrical potential due to the prolonged subsurface currents, providing a digital read-out of the relative metallic content of the subsurface. Note that the EM-61 focusing coil minimizes (but does not entirely eliminate) the response from surficial metallic reinforcing bars or debris that would mask the presence of deeper metal from standard EM, magnetic, metal detector, or GPR instruments.

To complete the EM-61 survey, a system of roughly parallel profiles (depicted as rows of black crosses in Figures 1 and 3) spaced approximately five feet apart were scanned by hand-towing the trailer-mounted EM-61 coils. Please note that some areas of the site were not accessible to the EM-61 (see Figures 1 through 4). Readings were time-stamped and automatically recorded on an Omnidata polycorder. Location control was maintained using a backpack-mounted GPS receiver (Trimble Pathfinder PRO-XR with TCS1 data logger) synchronized to the polycorder. The GPS positions were post-processed and differentially corrected using data from a fixed community base station in Brighton, MI. The resulting differential GPS (DGPS) positions have an accuracy of better than 3 feet.

The EM data were contoured using the statistical kriging routine in SURFER by Golden Software, and the resulting data contours are depicted in Figures 2 and 4. The contours represent the differential response, and depict subsurface metal with positive values (in millivolts or mV), with the effect of particularly massive surficial metal targets represented by spurious negative values.

Results

Boring Clearance

The subsurface utility survey results, in the form of field logs for each location, are included in Appendix A. Utilities detected within the survey areas are indicated in two ways: by question marks when their origin/type is unknown, and/or by the method used to delineate them (such as "GPR anomaly"). Utility traces were marked in the field as the survey progressed using semi-permanent pavement paint.

Please note that the accuracy of the utility tracing techniques employed for this survey can vary based on many site-specific subsurface conditions (e.g. soil composition, utility geometry and construction, etc.). Therefore, Enviroscan recommends that borings or excavations honor the 18-inch clearance zone for marked utilities as specified by Ohio One Call, and a 3-foot clearance zone for multiple utilities/duct banks (Ibid.).

Detection of disposal trenches, landfills and/or drum caches

The EM-61 results from scanning in Dibble Park and the employee parking lot are depicted as color contours in Figures 2 and 4, respectively. Known sources of metal, such as catchbasins and streetlamps, are included in these figures, in order to aid in the distinction between anomalies resulting from surficial and subsurficial metallic sources. The property fence, surrounding much of the survey area, is associated with a linear anomaly at the outer edge of both survey areas. Areas of distinctly elevated response are evident, and are enclosed by a black contour line and shaded in purple to red. The large linear grouping of anomalies encompassing most of the western border of the northern Dibble Park survey area (see yellow and purple shaded areas in Figure 2) (trending northeast-southwest) may be related to the historic rail system associated with the plant, or with overhead power lines located in the area.

Enviroscan identified 77 discrete EM anomalies or targets, not associated with known metallic sources, throughout both survey areas. These targets are numbered and noted with black triangles in Figures 2 and 4. Two clusters of targets can also be seen, labeled A and B in Figures 2 and 4. Clusters such as these, comprising several discrete targets intermingled in an area of generally elevated response, may indicate a disposal or landfill area. Comparison of the data from the previous geophysical survey shows that the footprint of Area A extends farther to the northeast than previously suspected. Further investigation of the areas and discrete targets discussed above with respect to subsurface metallic bodies is recommended.

Mr. Reitz
October 29, 2003
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Limitations

The geophysical survey described above was completed using standard and/or routinely accepted practices of the geophysical industry and equipment representing the best available technology. Please also note that the survey data are based on site conditions at the time of the geophysical investigation. Enviroscan does not accept responsibility for survey limitations due to inherent technological limitations or unforeseen site-specific conditions. However, we make every effort to identify and notify the client of such limitations or conditions.

We appreciate this opportunity to have worked with you again. If you have any questions, please do not hesitate to contact the undersigned.

Sincerely,
Enviroscan, Inc.

William E. Steinhart III, M.Sc., P.G.
Geophysics Project Manager

Technical Review By:
Enviroscan, Inc.
Felicia Kegel Bechtel

Felicia Kegel Bechtel, M.Sc., P.G. Cf
President

enc.: Figure 1: EM-61 Survey Stations, Dibble Park
Figure 2: EM-61 Differential Response Data Contours, Dibble Park
Figure 3: EM-61 Survey Stations, Employee Parking Lot
Figure 4: EM-61 Differential Response Data Contours, Employee Parking Lot
Appendix A: Boring Clearance Field Logs

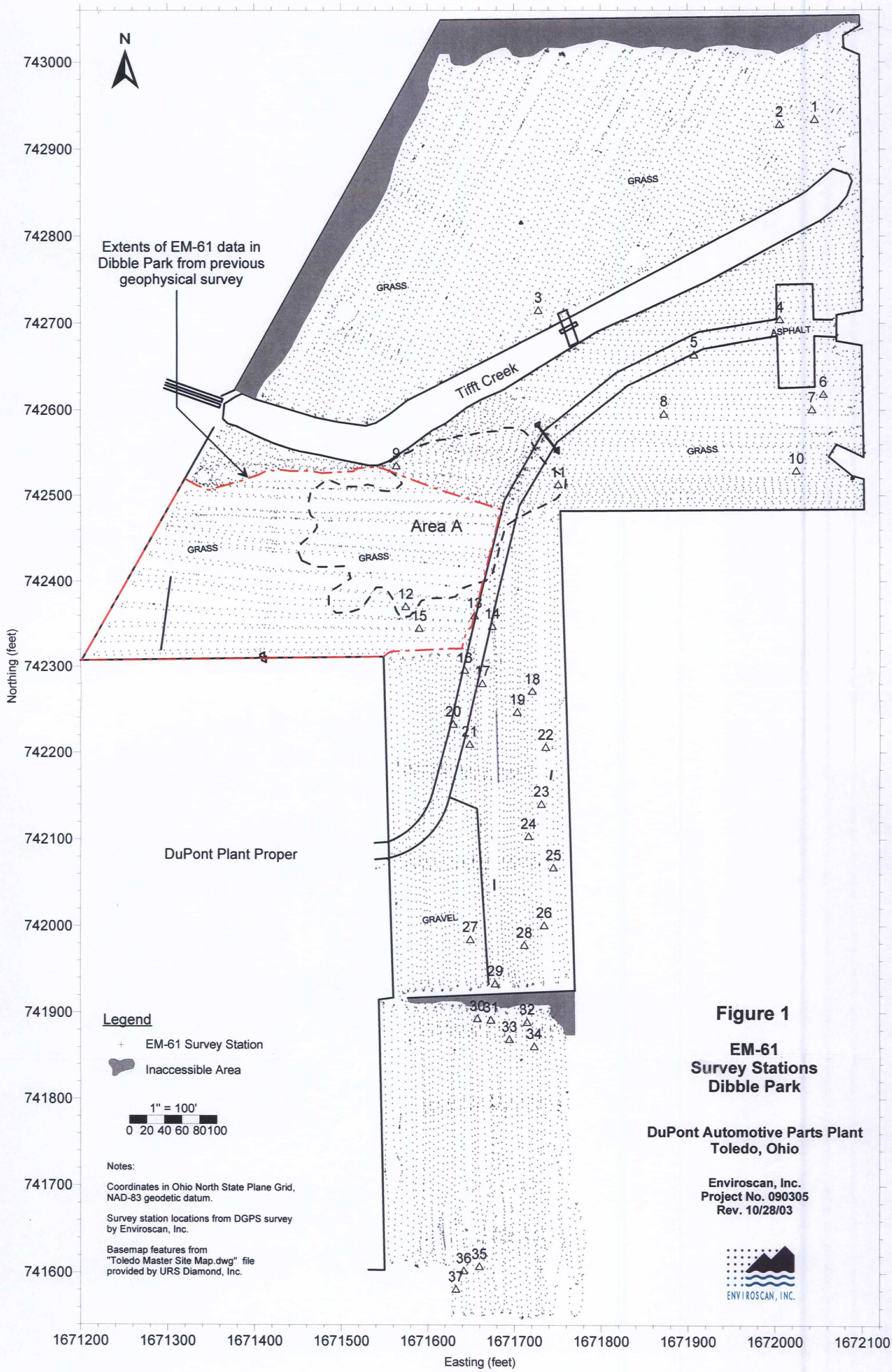
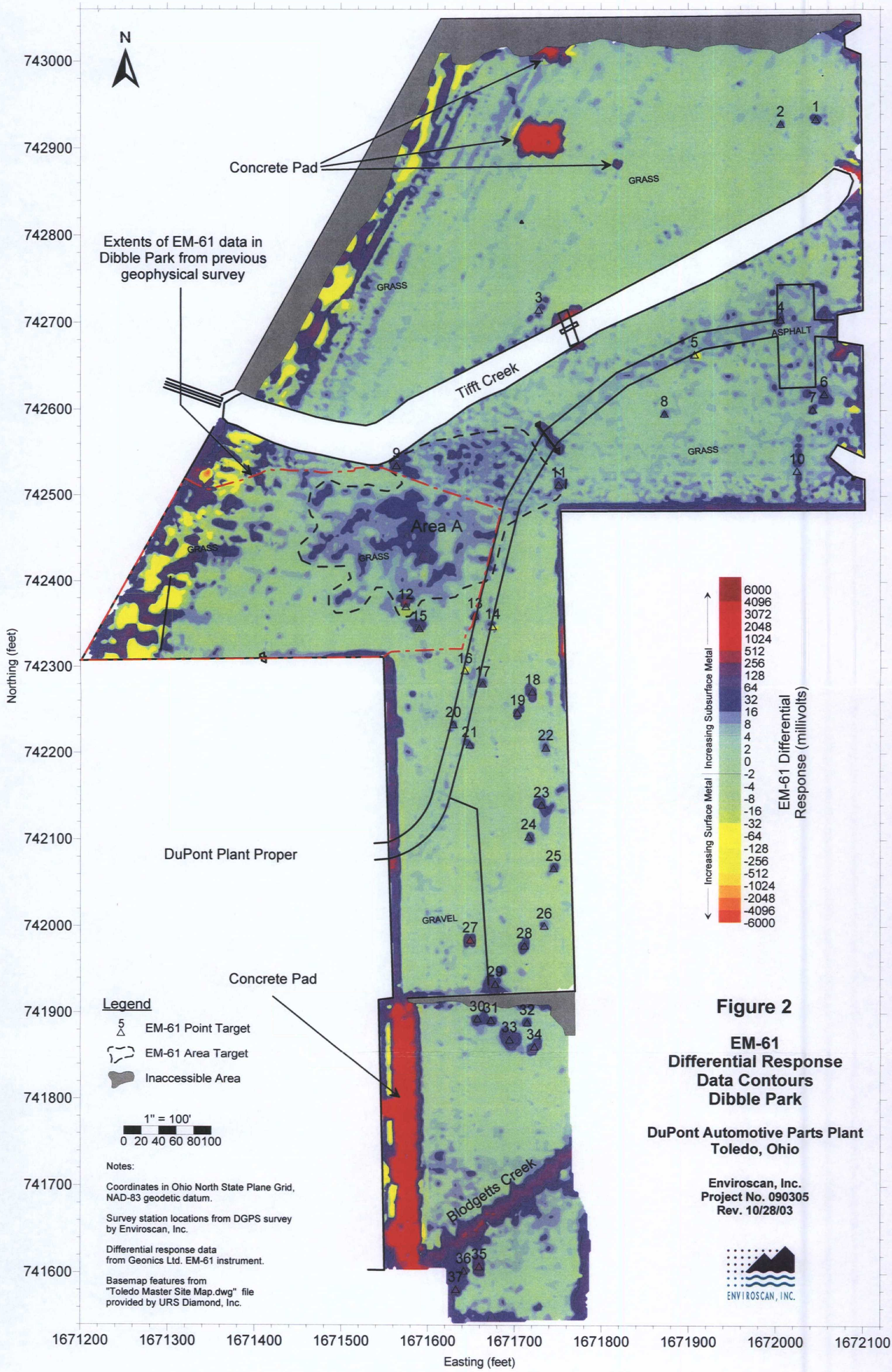


Figure 1

EM-61 Survey Stations Dibble Park



Notes:

Coordinates in Ohio North State Plane Grid, NAD-83 geodetic datum.

Survey station locations from DGPS survey by Enviroscan, Inc.

Differential response data from Geonics Ltd. EM-61 instrument.

Basemap features from "Toledo Master Site Map.dwg" file provided by URS Diamond, Inc.

Figure 2

EM-61 Differential Response Data Contours Dibble Park

DuPont Automotive Parts Plant Toledo, Ohio

**Enviroscan, Inc.
Project No. 090305
Rev. 10/28/03**

ENVIROSCAN, INC.

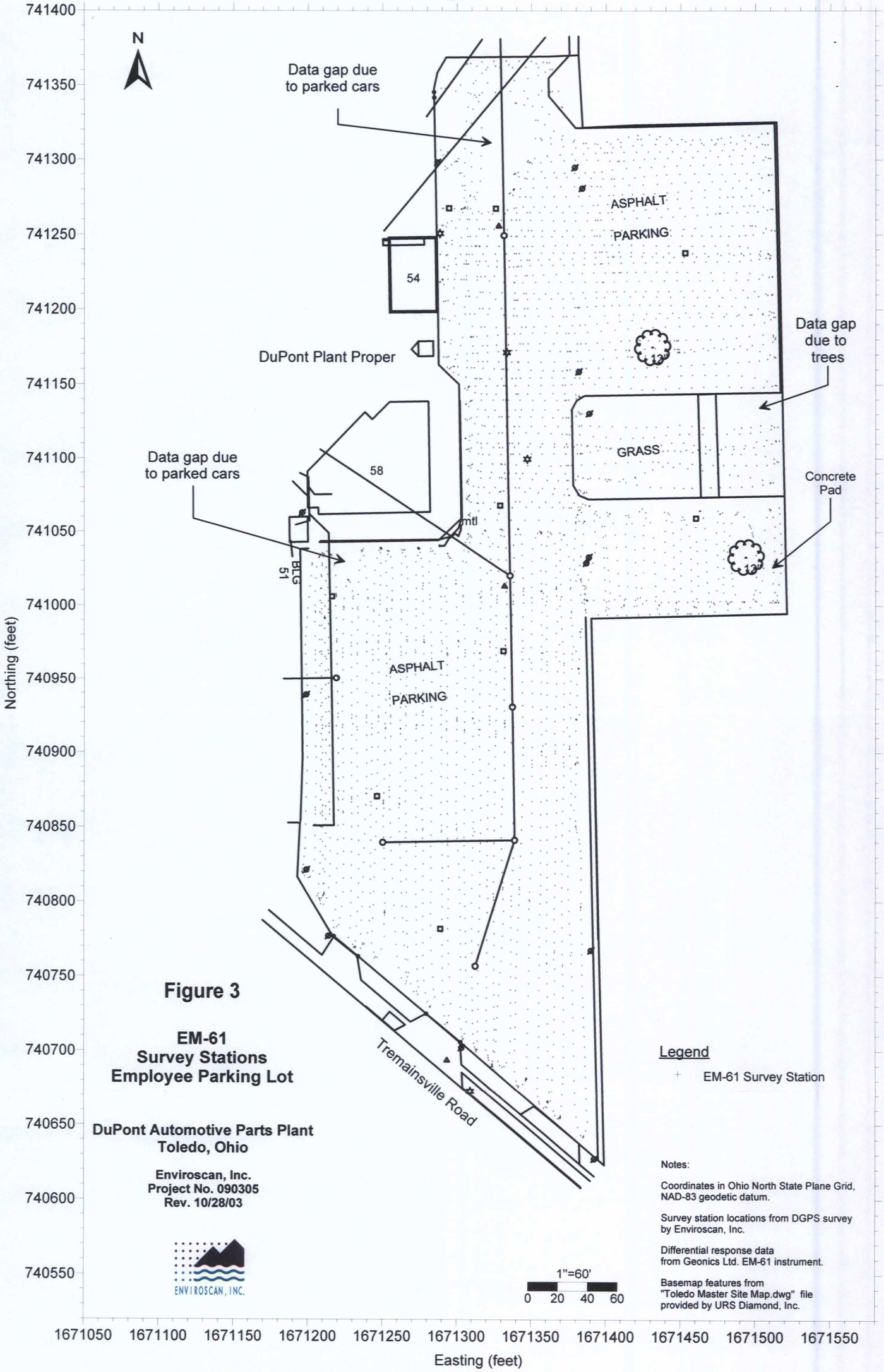


Figure 3

EM-61
Survey Stations
Employee Parking Lot

DuPont Automotive Parts Plant
Toledo, Ohio

Enviroscan, Inc.
Project No. 090305
Rev. 10/28/03

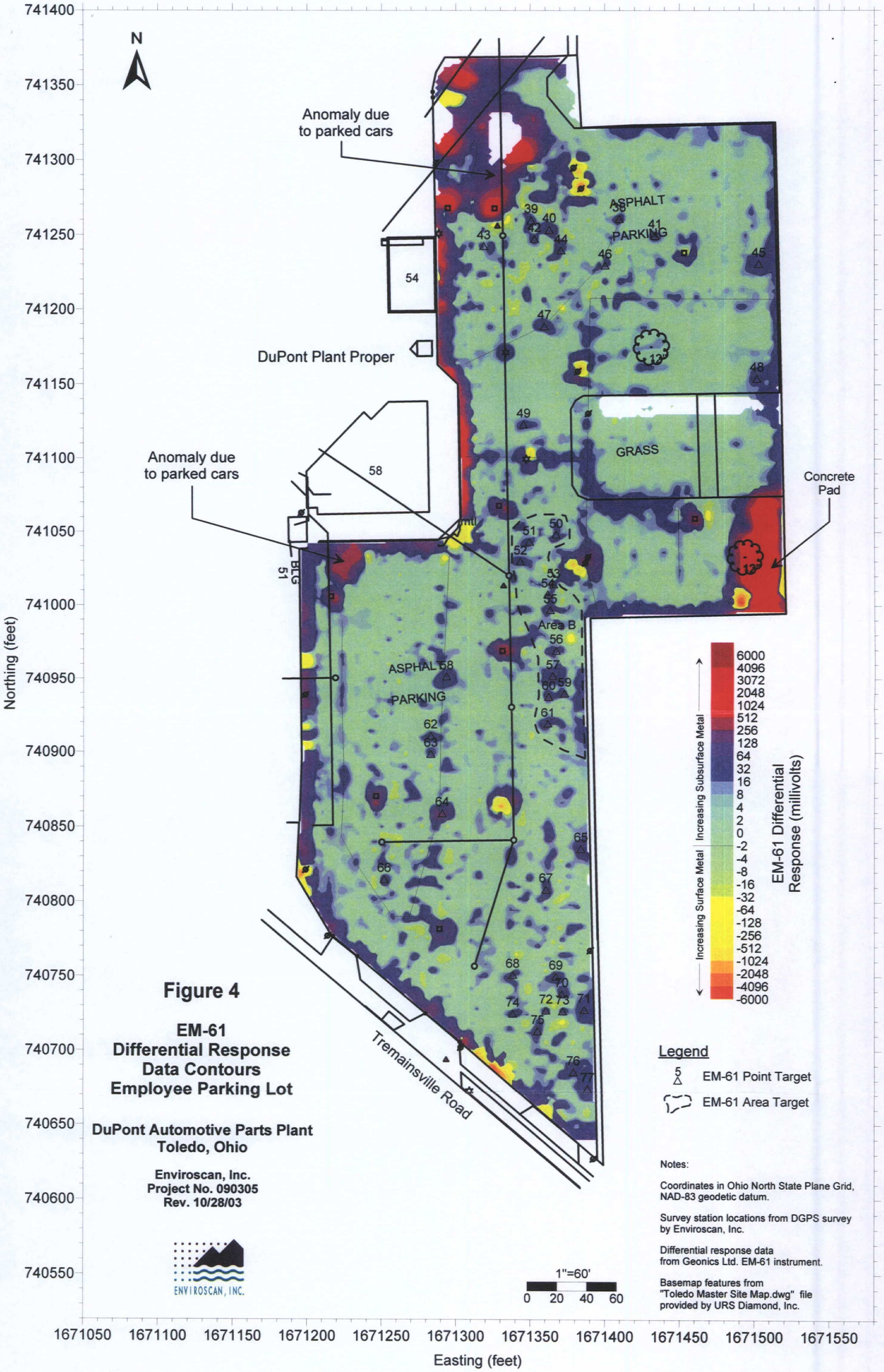


Figure 4

EM-61 Differential Response Data Contours Employee Parking Lot

DuPont Automotive Parts Plant
Toledo, Ohio

Enviroscan, Inc.
Project No. 090305
Rev. 10/28/03

Legend

- EM-61 Point Target
- EM-61 Area Target

Notes:

Coordinates in Ohio North State Plane Grid, NAD-83 geodetic datum.

Survey station locations from DGPS survey by Enviroscan, Inc.

Differential response data from Geonics Ltd. EM-61 instrument.

Basemap features from "Toledo Master Site Map.dwg" file provided by URS Diamond, Inc.

Appendix A

Boring Clearance Field Logs

Project No.: 090305	**Project Name: Dupont, Toledo**
Location: CRG-03	**Client: URS-Diamond**
Date: ~~10/25~~ 10/7	**Time:** 10:15

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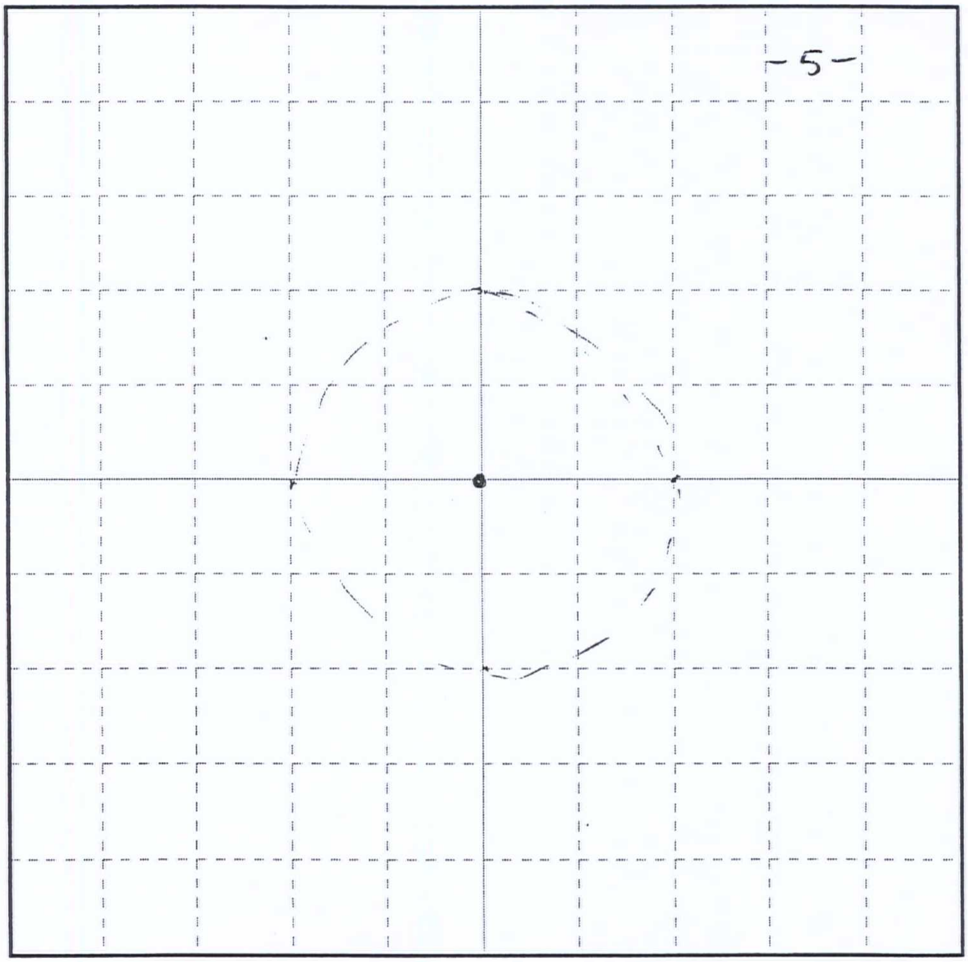
GPR.: SIR 2000/ SIR 2	Antenna: 500	Approx. Depth: ?
	Range: 50ns	File No.: 1
TW-6:	Setting: 7	
C.A.T.:	Setting: P R G	Color: Grn
FX-3:	Setting: 5	
Active Line Trace:	RD4000/RD433/TW-6	



Notes:
Two wells w/in survey area (to be drilled)
No CAT Done due to overhead power
TW-6 - No Anom.
GPR - No Anom
FX-3 - Scattered small anom.

Project No.: 090305	**Project Name:** Dupont, Toledo
Location: PZ -40	**Client:** URS-Diamond
Date: 10/7	**Time:** 11

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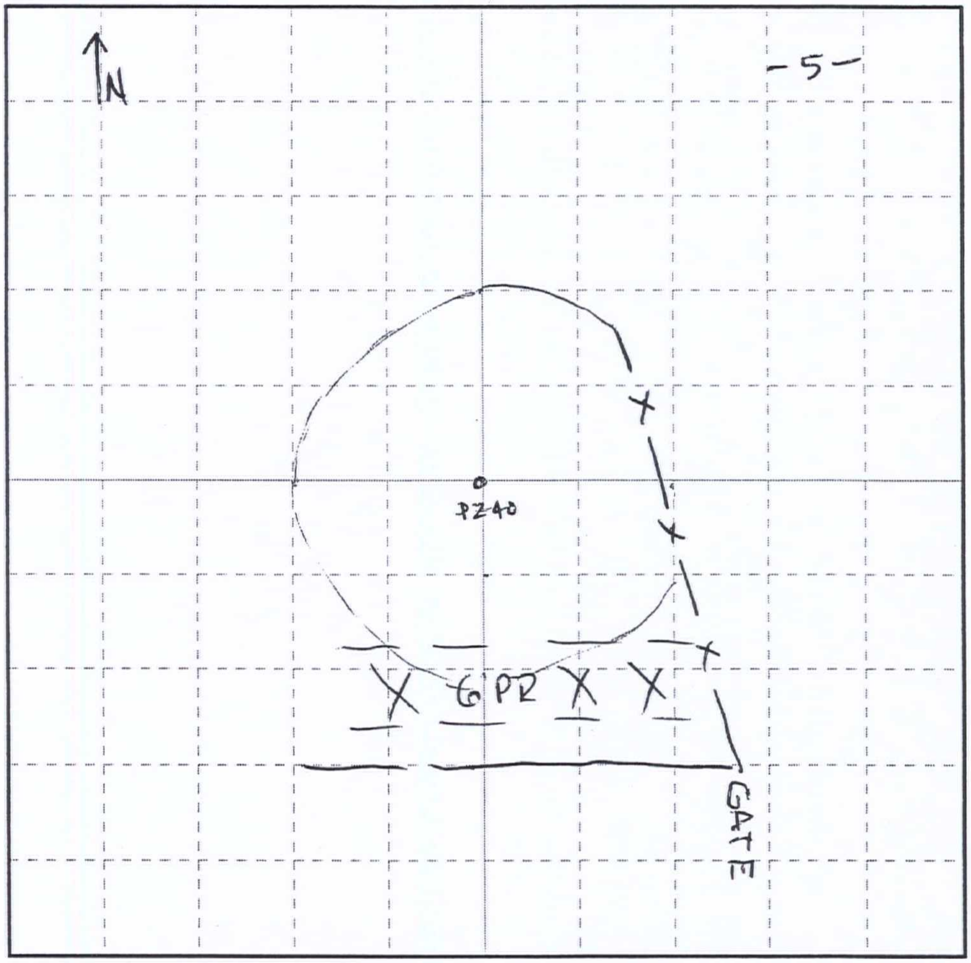
GPR.: SIR 2000 / SIR 2	Antenna: 500	Approx. Depth: —
	Range: 40ns	File No.: —
TW−6:	Setting: 7	
C.A.T.:	Setting: P R G	Color:
FX−3:	Setting: 5	
Active Line Trace:	RD4000/RD433/TW-6	



Notes:

No Anoms. detected for TW-6
CAT
FX-3

1 GPR anom

Project No.: 090305	**Project Name: Dupont, Toledo**
Location: BD ~~#~~ 3	**Client: URS-Diamond**
Date: 10/7	**Time:** 11:42

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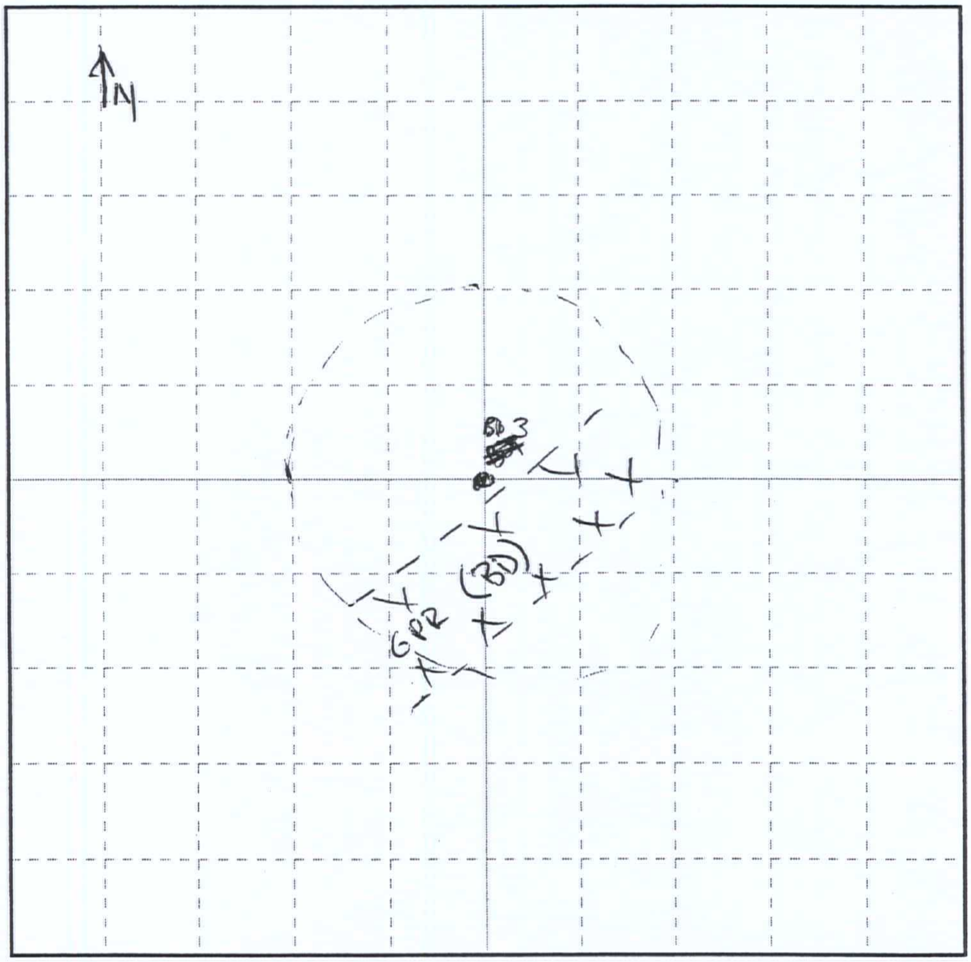
GPR.: SIR 2000 / SIR 2	Antenna: 500	Approx. Depth: 7-8 ft
	Range: 40	File No.: —
TW-6:	Setting: 7	
C.A.T.:	Setting: P R G	Color:
FX-3:	Setting: 5	
Active Line Trace:	RD4000/RD433/TW-6	



Notes:

★ Client indicated place with 2' of Blodgetts Creek Pipe

No TW-6/CAT/FX-3 anomalies

1 GPR anom. Blodgetts Crek (5-6' deep)

Project No.: 090305	Project Name: Dupont, Toledo	
Location: PZ-38	Client: URS-Diamond	
Date: 10/7	Time: 1:55	

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GPR.: SIR 2000 SIR 2	Antenna: 500	Approx. Depth: -
	Range: 40ns	File No.: -
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C.A.T.:	Setting: P R G	Color:
FX-3:	Setting: 5	
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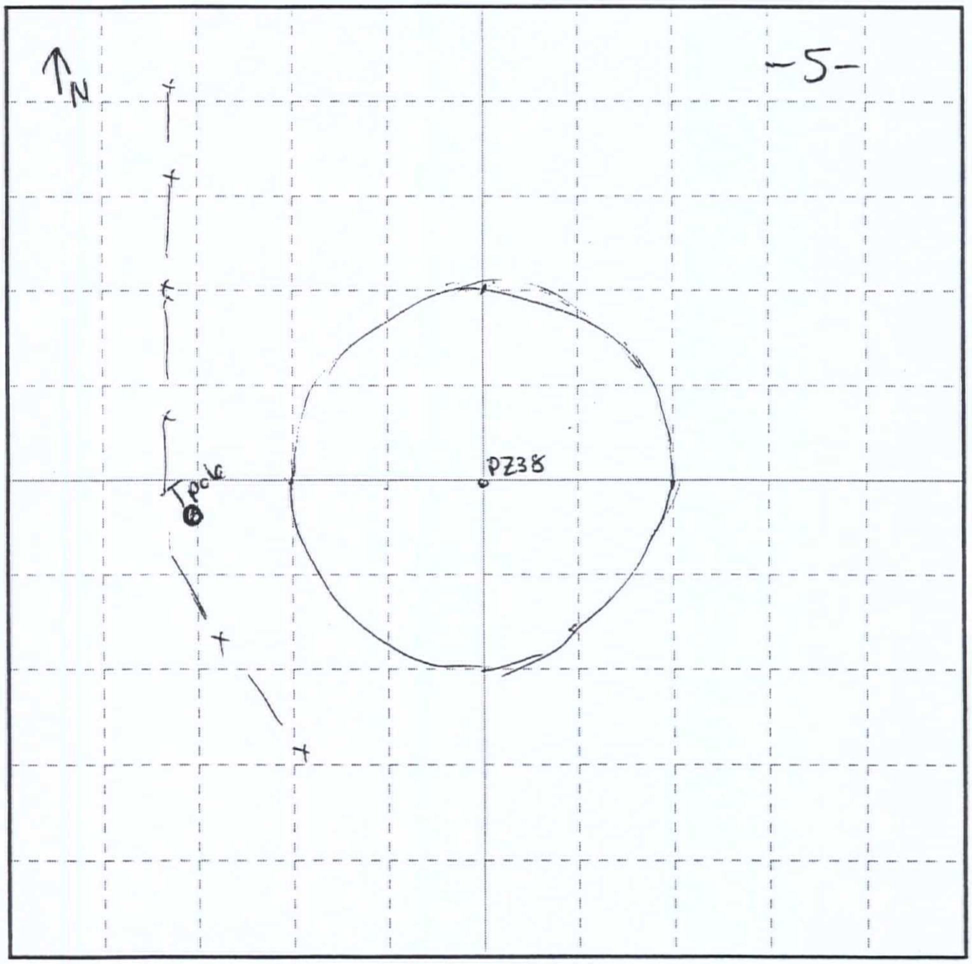

Notes:

NO anomalies detected

Project No.: 090305	**Project Name: Dupont, Toledo**
Location: PZ-39	**Client: URS-Diamond**
Date: 10/7	**Time:** 2:10

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GPR.: SIR 2000/ SIR 2	Antenna: 500	Approx. Depth: –
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C.A.T.:	Setting: P R G	Color:
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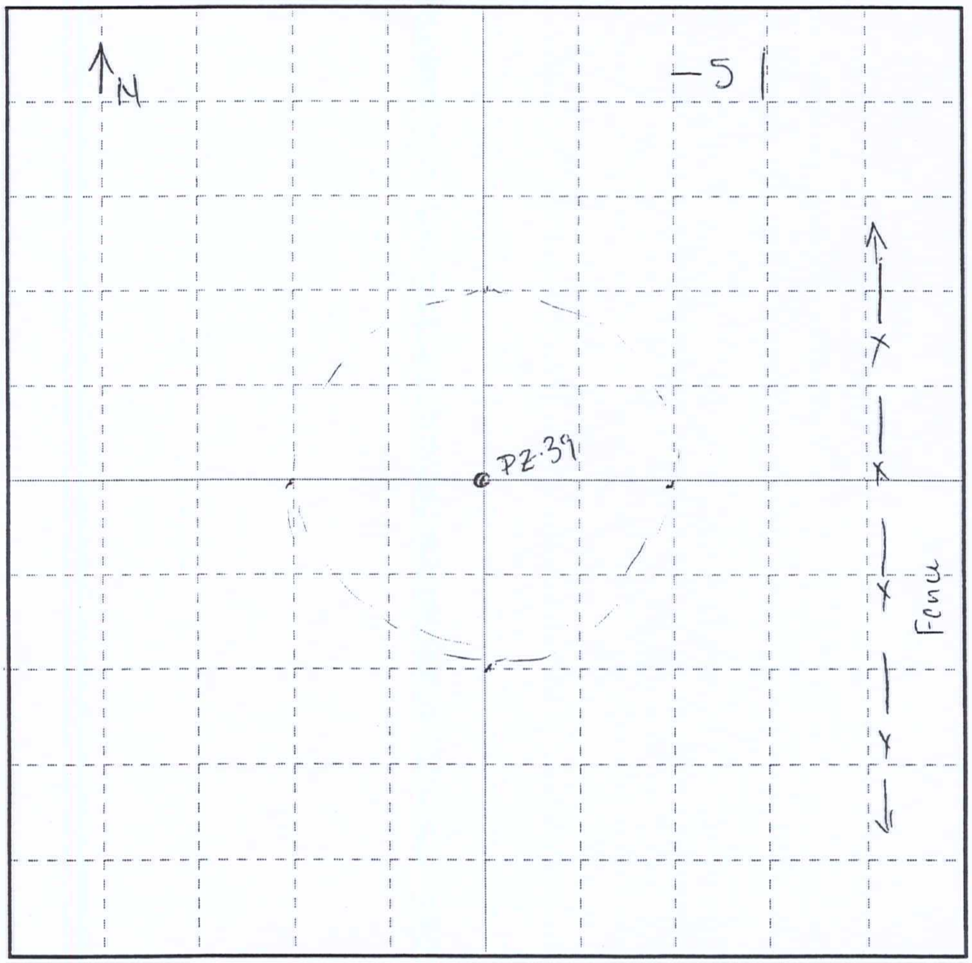
Active Line Trace:	RD4000/RD433/TW-6	



Notes:

* NO GPR Penetration

NO TW-6/CAT/FX anomalies

Project No.: 090305	**Project Name:** Dupont, Toledo
Location: CRG-11	**Client:** URS-Diamond
Date: 10/7	**Time:** 240

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GPR.: SIR 2000 / SIR 2	Antenna: 500	Approx. Depth: –
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C.A.T.:	Setting: P R G	Color:
FX-3:	Setting: 5	
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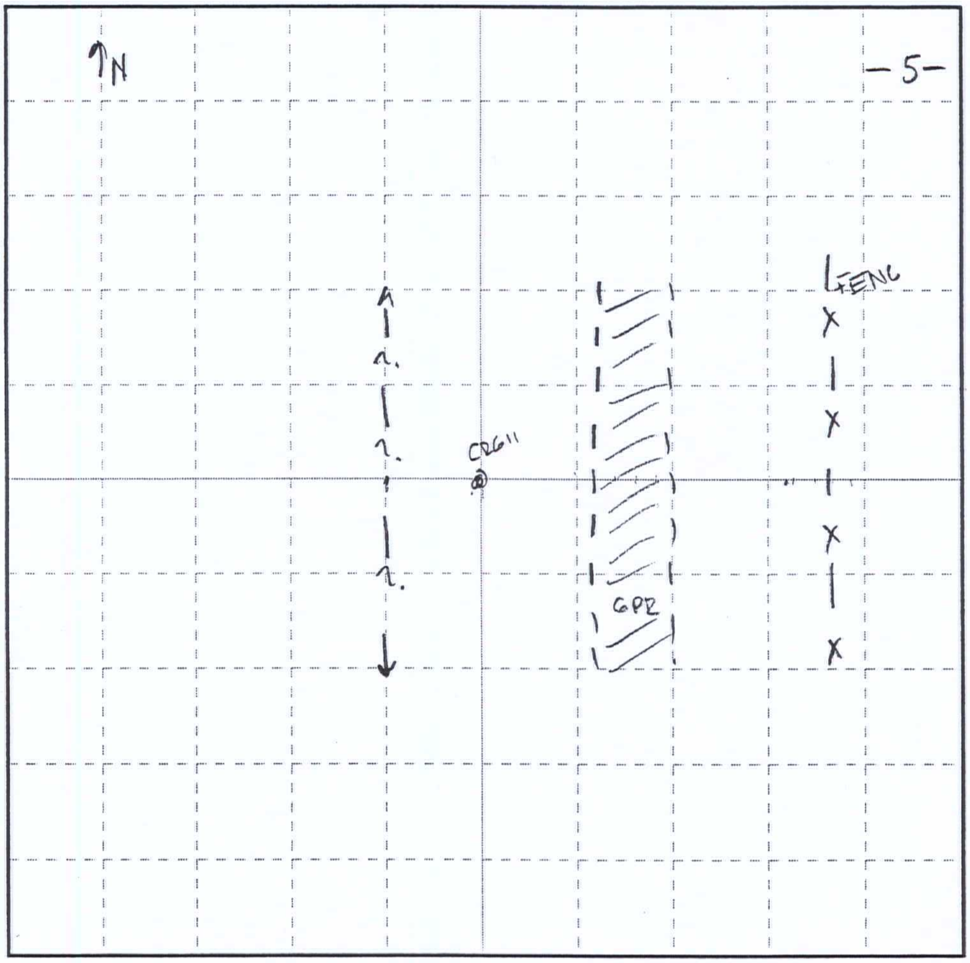

Notes:

2 GPR anoms 5-7ft deep - 4' wide
1-4ft deep <1' wide

No TW-6 / CAT / FX anomali

Double well location

Project No.: 090305	Project Name: Dupont, Toledo
Location: BD.4	Client: URS-Diamond
Date:	Time:

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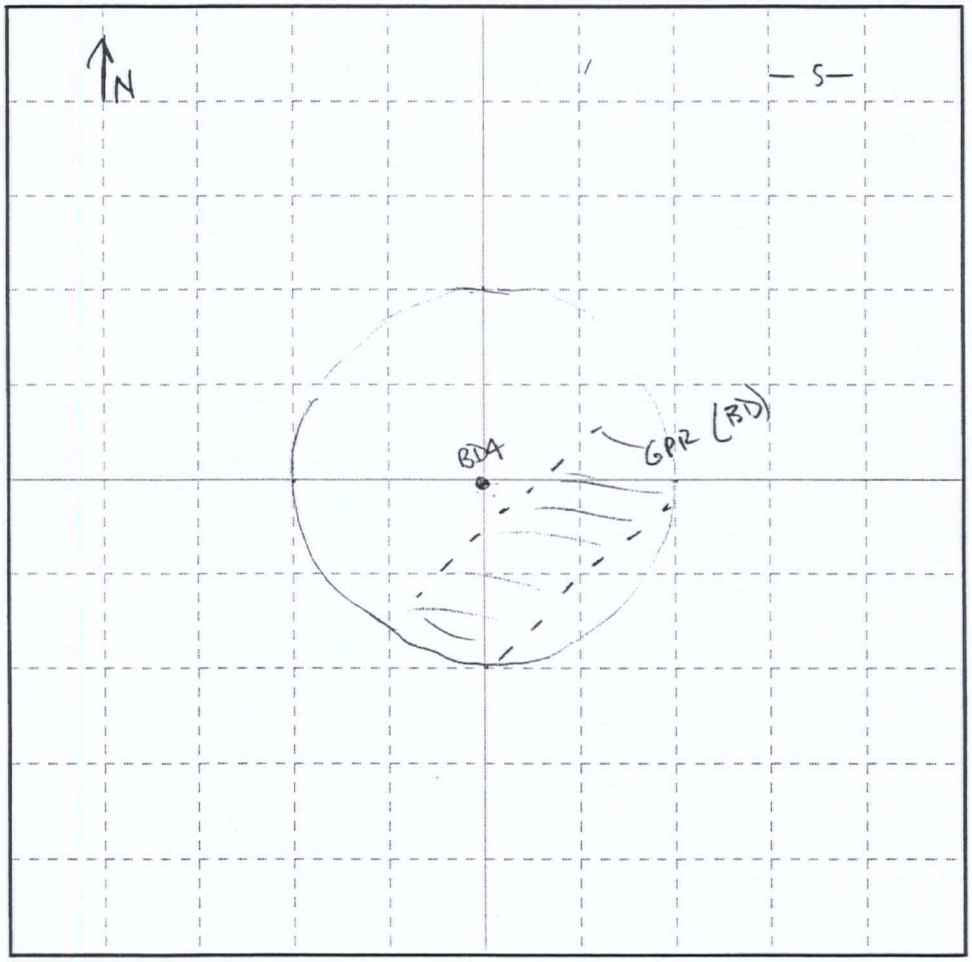
GPR.:	Antenna: 500	Approx. Depth: –
SIR 2000/ SIR 2	Range: 40ns	File No.: –
TW-6:	Setting: 7	
C.A.T.:	Setting: P R G	Color:
FX-3:	Setting: 5	
Active Line Trace:	RD4000/RD433/TW-6	



Notes:

1 GPR anom. – BD

No other anoms.

Project No.: 090305	Project Name: Dupont, Toledo
Location: CRG-10	Client: URS-Diamond
Date: 10/7	Time: 4:10

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GPR.: SIR 2000 / SIR 2	Antenna: 500	Approx. Depth: 7-8-10
	Range: 40ns	File No.: -
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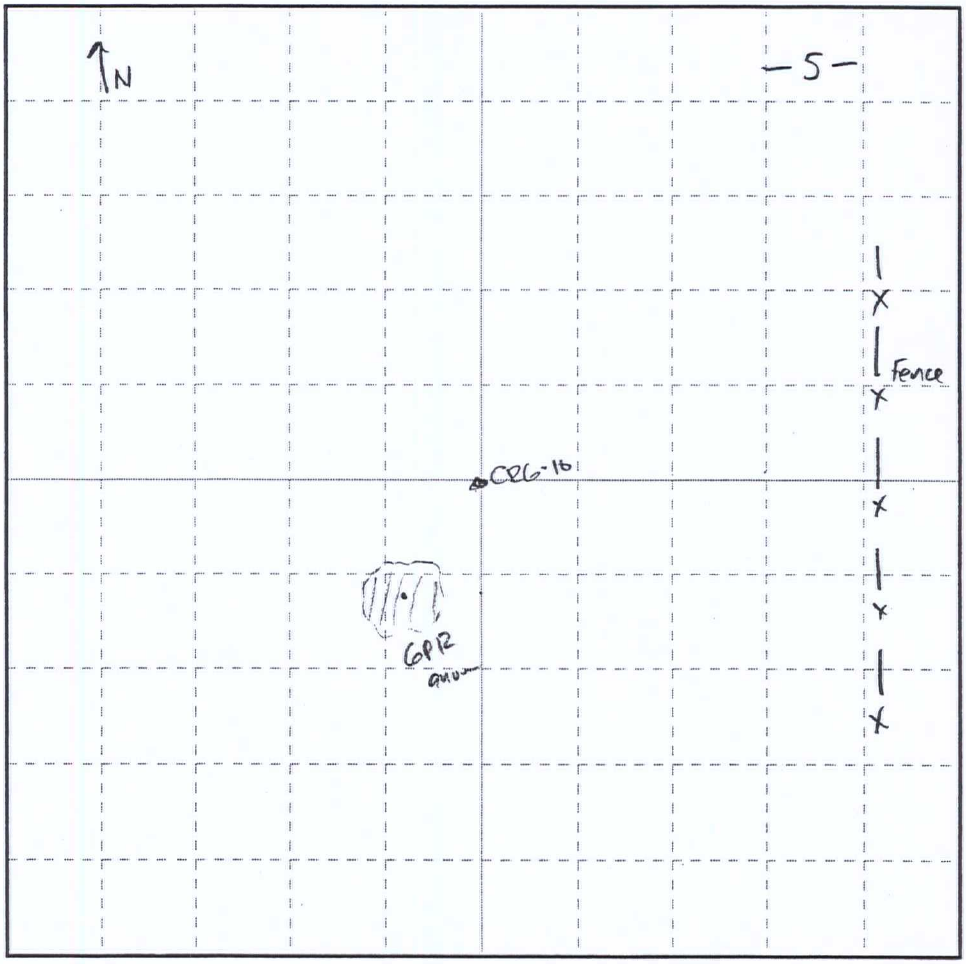
C.A.T.:	Setting: P R G	Color:
FX-3:	Setting: 5	
Active Line Trace:	RD4000/RD433/TW-6	



Notes:

1 GPR anom. point 2-4 feet down 2' dig

No TW-6 /CAT /FX anom.

Project No.: 090305	**Project Name: Dupont, Toledo**
Location: PZ · 43	**Client: URS-Diamond**
Date: 10/7	**Time:** 4:30

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GPR.: SIR 2000, SIR 2	Antenna: 500	Approx. Depth: —	
	Range: 40ns	File No.: —	
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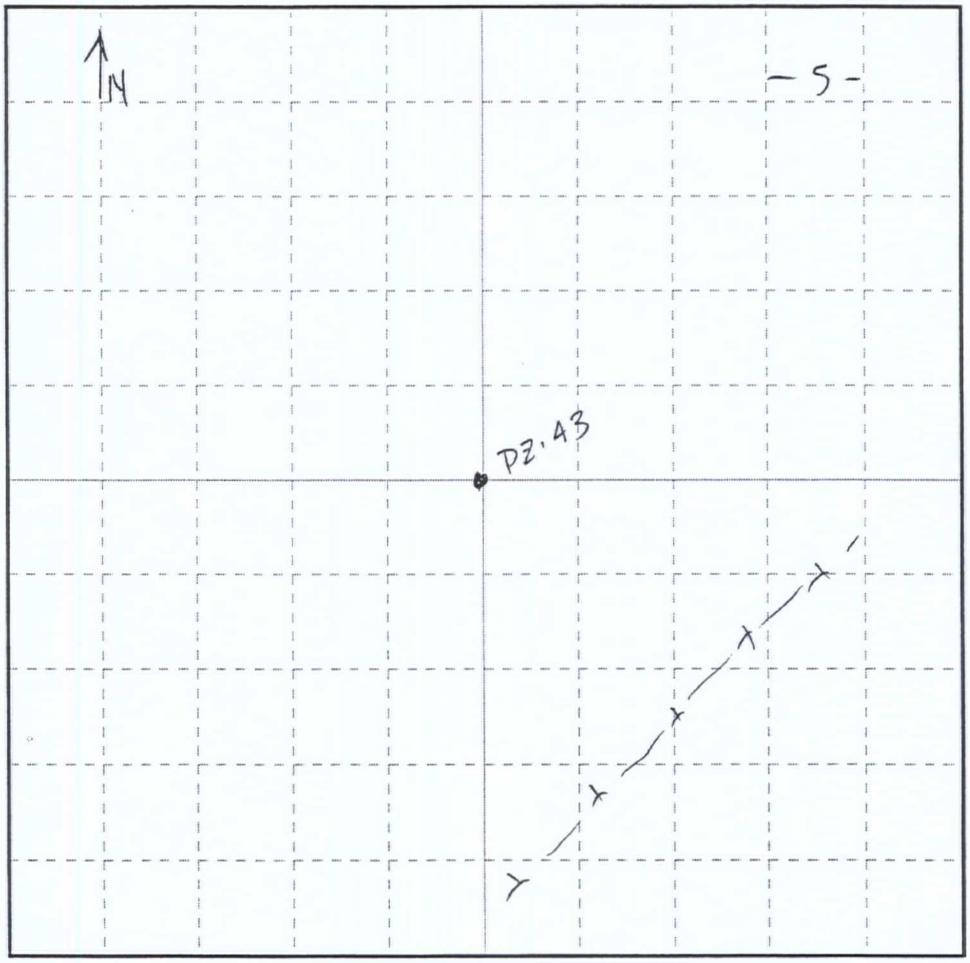
C.A.T.:	Setting: P R G	Color:	
FX-3:	Setting: 5		
Active Line Trace:	RD4000/RD433/TW-6		



Notes:

No anoms. detected (TW-6 / GPR / FX)

* CAT ineffective due to Overhead lines

Project No.: 090305	**Project Name:** Dupont, Toledo
Location: CRG-09	**Client:** URS-Diamond
Date: 10/8	**Time:** 9:10

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GPR.: SIR 2000/ SIR 2	Antenna: 500	Approx. Depth: –
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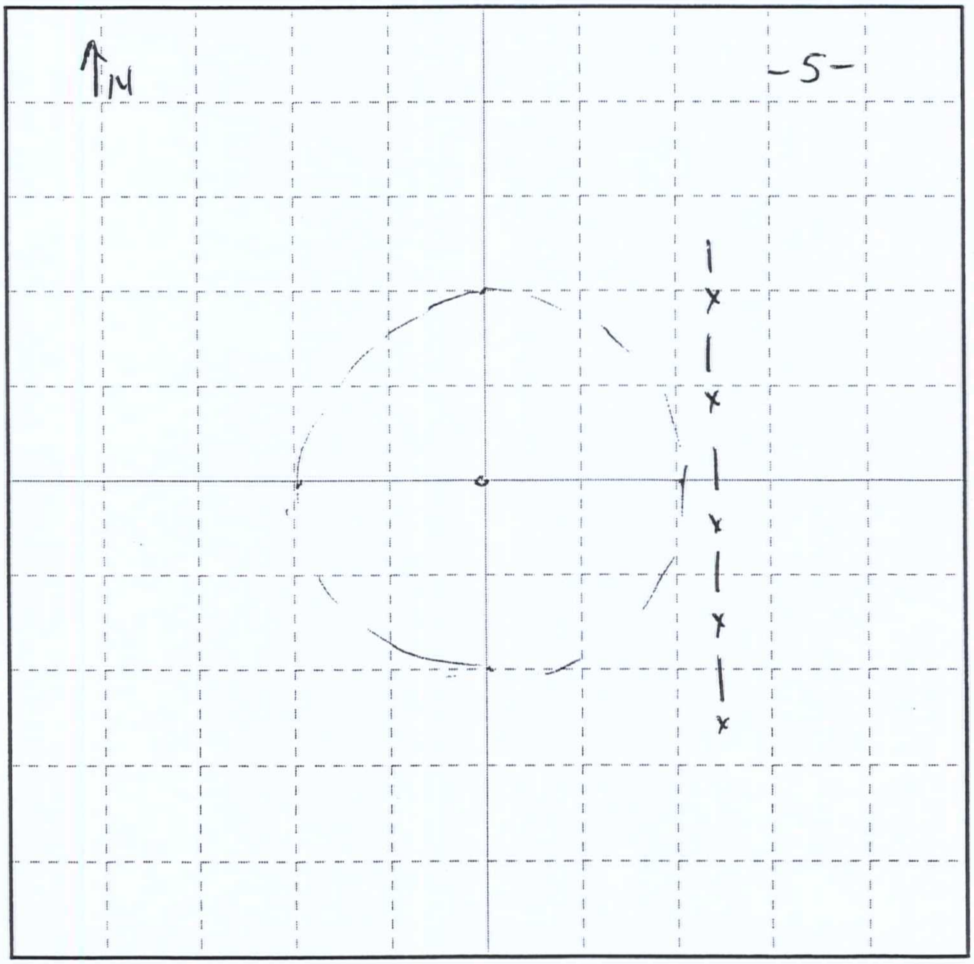
C.A.T.:	Setting: P R G	Color: Grn
FX–3:	Setting: 5	
Active Line Trace:	RD4000/RD433/TW–6	



Notes:

NO anomalies detected

2 well location

Project No.: 090305	**Project Name: Dupont, Toledo**
Location: CRG-05	**Client: URS-Diamond**
Date: 10/8	**Time:** 9:36

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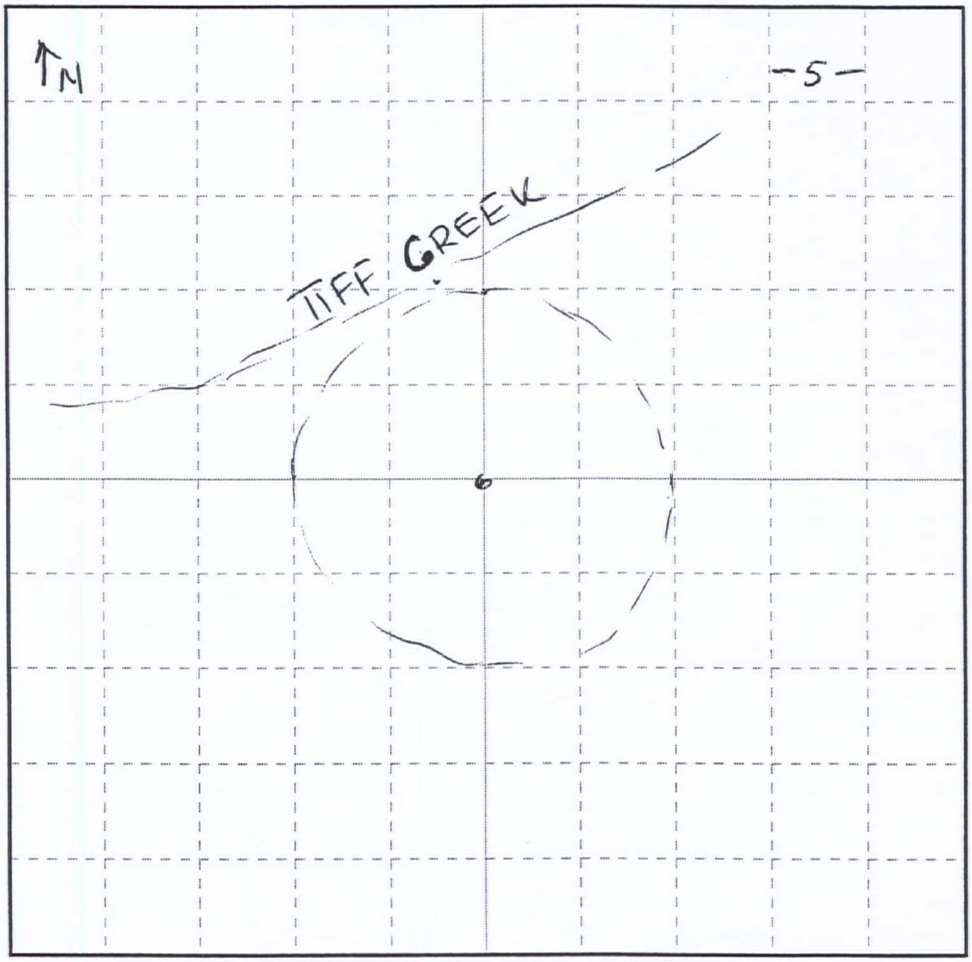
GPR.: SIR 2000 / SIR 2	Antenna: 500	Approx. Depth: –
	Range: 40ns	File No.:
TW-6:	Setting: 7	
C.A.T.:	Setting: P R G	Color:
FX-3:	Setting: 5	
Active Line Trace:	RD4000/RD433/TW-6	



Notes: No anomalies detected

2 well location

Project No.: 090305	Project Name: Dupont, Toledo
Location: CRG - 06	Client: URS-Diamond
Date: 10/8	Time: 10:55

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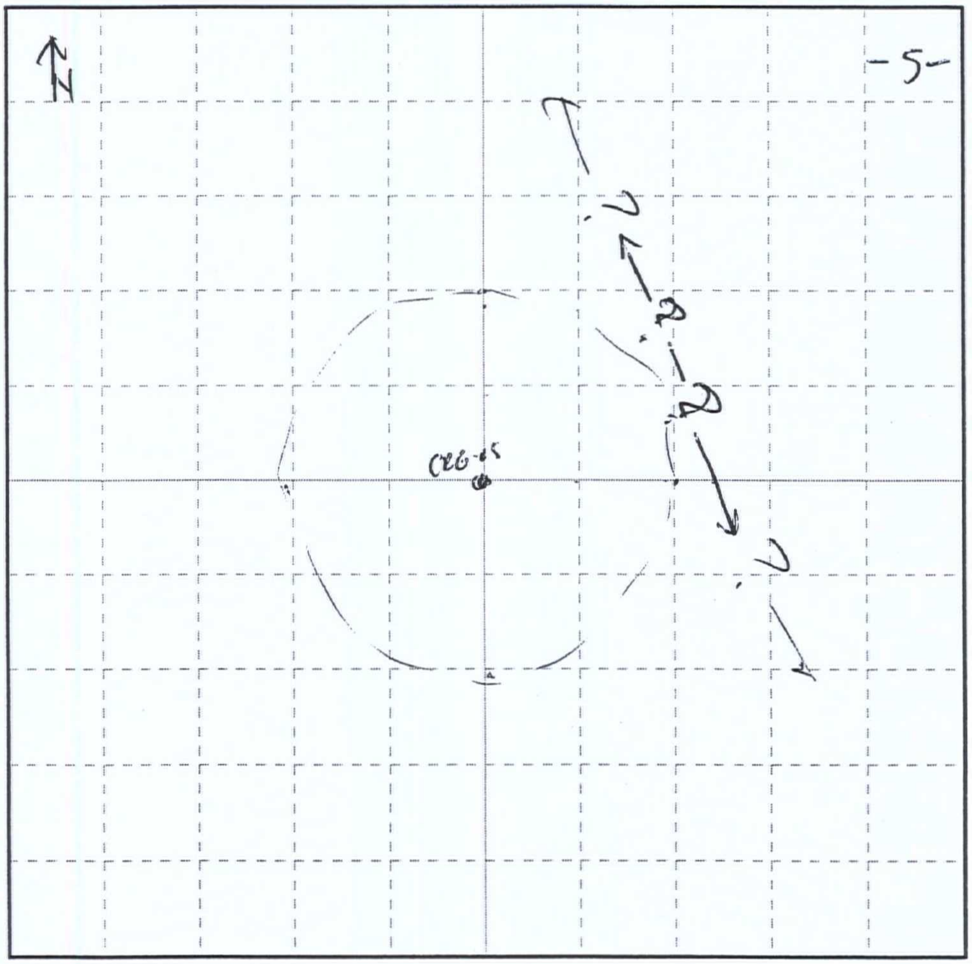
GPR.: SIR 2000 / SIR 2	Antenna: 500	Approx. Depth: 8'
	Range: 40ns	File No.: --
TW-6:	Setting: 7	
C.A.T.:	Setting: P R G	Color:
FX-3:	Setting: 5	
Active Line Trace:	RD4000/RD433/TW-6	



Notes:

- 1 GPR/TW-6/CAT(R) anomaly
  2-4' deep linear suspected util
- NO FX-3 anoms
- Location moved (before survey) due to brush/Tree interference of drill rig

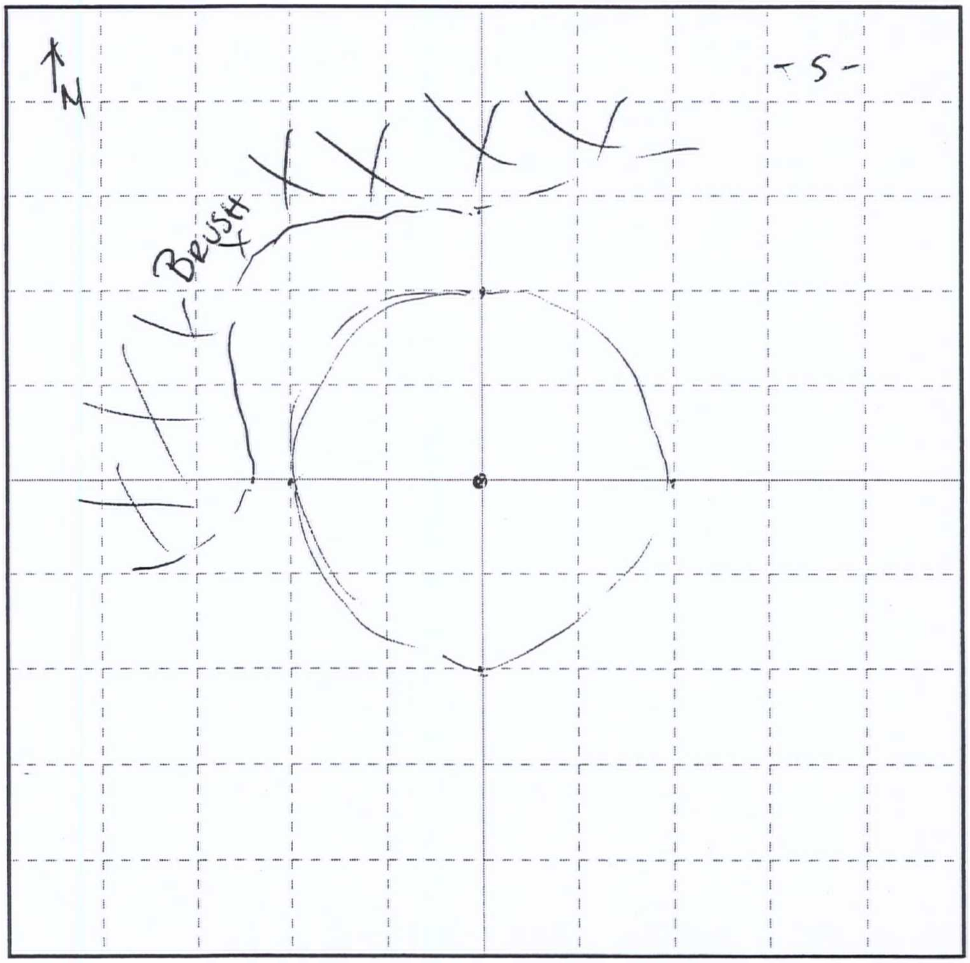
2 well location

Project No.: 090305	**Project Name: Dupont, Toledo**
Location: CRC · 07	**Client: URS-Diamond**
Date: 10/8	**Time:** 10:15

ENVIROSCAN, INC.

1051 Columbia Ave.
Lancaster, PA 17603
(717) 396 - 8922
Fax: (717) 396 - 8746
email@enviroscan.com
www.enviroscan.com

GPR.: SIR 2000/ SIR 2	Antenna: 500	Approx. Depth: –
	Range: 40ns	File No.: –
TW-6:	Setting: 7	
C.A.T.:	Setting: P R G	Color:
FX-3:	Setting: 5	
Active Line Trace:	RD4000/RD433/TW-6	



Notes:

- No anomalies detected
- Location moved prior to survey due to brush/Tree interference w/ drill rig
- 2 well location

Project No.: 090305	**Project Name: Dupont, Toledo**
Location: CRG-05 (2)	**Client: URS-Diamond**
Date: 10/8	**Time:** 11:20

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GPR.: SIR 2000/ SIR 2	Antenna: 500	Approx. Depth: —
	Range: 40ns	File No.: .
TW–6:	Setting: 7	
C.A.T.:	Setting: P R G	Color:
FX–3:	Setting: 5	
Active Line Trace:	RD4000/RD433/TW–6	

Notes:

No anomalies detected

CRG-05 moved to new location CRG-05(1) not valid

Project No.: 090305	**Project Name: Dupont, Toledo**
Location: CRG·08	**Client: URS-Diamond**
Date: 10/18	**Time:** 11:35

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email@enviroscan.com
www.enviroscan.com

GPR.: SIR 2000/ SIR 2	Antenna: 500	Approx. Depth:
	Range: 40.15	File No.:
TW-6:	Setting: 7	
C.A.T.:	Setting: P R G	Color:
FX-3:	Setting: 5	
Active Line Trace:	RD4000/RD433/TW-6	

Notes: No anomalies detected

ENVIROSCAN, INC.

Final Report
Phase I Geophysical Survey
Infrastructure Detection/Tracing and
Suspected Disposal Area Delineation
DuPont Automotive Products
Toledo, OH
Enviroscan Project Number 090204a

FILE

Prepared For: URS-WC Diamond
Prepared By: Enviroscan, Inc.
October 15, 2002

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ENVIROSCAN, INC.

October 15, 2002

Mr. Larry T. Reitz
URS-WC Diamond
Barley Mill Plaza
Building 27
Wilmington, DE 19880-0027

RE: Phase I Geophysical Survey
Infrastructure Detection/Tracing and Suspected Disposal Area Delineation
DuPont Automotive Products
Toledo, OH
Enviroscan Project Number 090204a

Dear Mr. Reitz:

Pursuant to our revised proposal dated September 5, 2002, Enviroscan, Inc., has completed a multi-technique geophysical survey of the above-referenced site. The following report and figures detail the methods and results of the survey.

Background and Purpose

The site is occupied by a Dupont Automotive Parts Facility that produces resins for the automotive industry. Historically, this plant also produced paint for use in the automotive industry. The purposes of the survey were to provide detection and tracing of various infrastructure elements, as well as suspected buried disposal areas. Specifically, the geophysical survey was intended to:

1) mark and map the trace of the fully contained and buried Blodgetts Creek,

2) characterize the dimensions and construction of conduit carrying Blodgetts Creek,

3) locate, mark, and map the locations of suspected buried production wellheads,

4) provide utility clearance for approximately 15 proposed borings or geoprobes,

5) delineate suspected possible disposal trenches, landfills and/or drum caches, and

6) provide reconnaissance-level delineation (if possible) of suspected non-aqueous phase liquid (NAPL).

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Methods

In order to satisfy the survey purposes, Enviroscan completed a multi-technique geophysical survey on September 24 through 27, 2002. The principles, methods, and results for each survey technique are detailed below. Please note that the location of the production wellheads had already been ascertained prior to the field survey by the client from historic maps.

Boring Clearance

The utility survey (Figure 1) was completed using standard and/or routinely accepted practices of the geophysical industry and equipment representing the best available technology, including:

- a Fisher TW-6 electromagnetic (EM) pipe and cable locator/tracer;
- a Fisher FX-3 magnetic (MAG) locator;
- a Radiodetection C.A.T. and Genny pipe and cable locator/tracer;
- a Radiodetection RD4000 Multi-Frequency pipe and cable tracer; and
- a GSSI SIR-2000 ground penetrating radar (GPR) system.

TW-6

In order to detect and trace underground utilities, Enviroscan employed a Fisher TW-6 pipe and cable locator/tracer. In pipe and cable search mode, the TW-6 is essentially a deep-sensing metal detector that detects any highly electrically conductive materials (e.g. metals) by creating an electromagnetic field with a transmitting coil. A receiving coil at a fixed separation from the transmitter measures the field strength. As the instrument is swept along the ground surface, subsurface metallic bodies distort the transmitted field. The change in field strength/orientation is sensed by the receiver, setting off an audible alarm and causing deflection of an analog meter. The TW-6 can nominally detect a 2-inch metal pipe to a depth of 8 feet and a 10-inch metal pipe to a depth of 14 feet. In pipe and cable tracing mode, the TW-6 transmitter can be coupled directly (conductively) to exposed portions of a metallic pipe, cable, or wire or inductively to a subsurface metallic utility with known location and orientation. The transmitter remains stationary and energizes or excites the metallic utility to be traced with an 81.92-kilohertz signal that can be traced at the ground surface using the mobile TW-6 receiver wand or probe. In addition, approximate depths to metallic utilities can be determined using inductive or conductive mode triangulation.

C.A.T. and Genny

The survey areas were also scanned with a Radiodetection C.A.T. and Genny pipe and cable locator and tracer. In Power mode, the C.A.T. detects the 50 to 60 Hertz (Hz) electromagnetic field generated by live power cables and other metallic utilities to which a live line is grounded. In Radio mode, the C.A.T. detects buried conductors (cables or metallic pipes) as they conduct and re-transmit commercial broadcast radio energy. In Genny mode, the C.A.T. detects signal generated by the Genny transmitter. The Genny transmitter can be coupled directly (conductively) to exposed portions of a metallic pipe, cable, or wire or inductively to a subsurface metallic utility with known location and orientation. In addition, the C.A.T. can be used to track a miniature, waterproof sonde or "mole" inserted into any accessible pipe by a variety of means – including floating it down a fluid-filled pipe (often called "pigging"), pushing it through the pipe with flexible fiberglass rods (typically limited to approximately 200 feet of insertion), or hand-carrying it through an evacuated pipe (with proper confined space entry controls).

RD4000

Utility tracing was also conducted using a Radiodetection RD4000 digital cable and pipe tracer and transmitter. Similar to the TW-6 and C.A.T./Genny, the transmitter can be directly coupled to exposed portions of a metallic pipe, cable, or wire or indirectly (inductively) to a subsurface metallic utility of known location/orientation. The transmitter remains stationary and energizes the metallic utility at a frequency selected by the operator (512 Hz, 8 kHz, 33 kHz, or 65 kHz), which is received at the ground surface by the RD4000 receiver. When the transmitter is coupled directly to the metallic utility, the RD4000 digital receiver can also calculate the depth of the utility to an accuracy of ±10% of the actual depth of the utility. Please note the close proximity to bends in the traced line or poor signal strength can result in erroneous depth estimations. The RD4000 can also trace a "mole" in the same fashion as the C.A.T., as described above.

FX-3

Enviroscan also employed a Fisher FX-3 magnetic locator. The FX-3 contains two sensors that measure the difference in total strength of the earth's magnetic field between two fixed heights above the ground surface (i.e. the magnetic gradient). In the absence of artificial magnetic fields or buried ferromagnetic objects, the natural gradient of the earth's field is relatively constant. Where buried magnetic or ferromagnetic objects (e.g. magnetite or iron respectively) are present, the gradient varies rapidly as the instrument is swept along the ground surface, triggering an audible alarm. The MAG instrument employed for this survey can nominally detect a 2-inch steel pipe to a depth of 4 feet.

GPR

GPR systems produce cross-sectional images of subsurface features and layers by continuously emitting pulses of radar frequency energy from a scanning antenna as it is towed along a survey profile. The radar pulses are reflected by interfaces between materials with differing dielectric properties. The reflections return to the antenna and are displayed on a video monitor as a continuous cross section in real time. Since the electrical properties of metal are distinctly different from soil and backfill materials, metallic pipes and other structures commonly produce dramatic and characteristic reflections. Fiberglass, plastic, concrete, and terra-cotta pipes and structures also produce recognizable, but less dramatic reflections. Scanning was performed using a GSSI SIR-2000 GPR controller with an internal hard drive and a color display, and both a high-frequency, high-resolution 500 megaHertz (MHz) antenna or transducer, and a lower frequency, deep-penetrating 200 MHz transducer.

Please note that onsite testing indicated that GPR penetration depth was severely limited over most of the site due to metallic reinforcing in the numerous concrete pads, as well as possibly electrically conductive soils and/or fill material underlying the site. In certain cases, GPR was of limited use in the tracing of utilities of a known orientation.

Detection of Disposal Trenches, Landfills and/or Drum Caches

EM

Enviroscan performed mapping of subsurface metallic masses using a Geonics EM-61 instrument. The EM-61 uses a one-meter by ½-meter coil to transmit 150 electromagnetic pulses per second into the ground at each measurement station. A second transmitter coil is used to narrowly focus the pulses, making the instrument relatively insensitive to overhead and/or nearby sources of electromagnetic interference such as buildings, fences, power lines, surficial debris, and atmospheric electromagnetic activity. During the off-time between transmitted pulses, a receiver coil measures the decay of transient electrical currents induced by the transmitted pulses. Electrical currents in moderately conductive earth materials (e.g. electrolytic soils) dissipate rapidly, leaving the more prolonged currents due to buried metallic objects. The EM-61 measures the surficial electrical potential due to the prolonged subsurface currents, providing a digital read-out of the relative metallic content of the subsurface. Note that the EM-61 focusing coil minimizes (but does not entirely eliminate) the response from surficial metallic reinforcing bars or debris that would mask the presence of deeper metal from standard EM, magnetic, metal detector, or GPR instruments.

To complete the EM-61 survey, a system of roughly parallel profiles (depicted as rows of red crosses in Figure 2) spaced approximately five feet apart were scanned by hand-towing the trailer-mounted EM-61 coils. Readings were time-stamped and automatically recorded on an Omnidata polycorder. Location control was maintained using a backpack-mounted GPS receiver (Trimble Pathfinder PRO-XR with TCS1 data logger) synchronized to the polycorder. The GPS positions were post-processed and differentially corrected using data from a fixed community base station in Brighton, MI. The resulting differential GPS (DGPS) positions have an accuracy of better than 3 feet.

The EM data were contoured using the statistical kriging routine in SURFER by Golden Software, and the resulting data contours are depicted in Figure 3. The contours represent the differential response, and depict subsurface metal with positive values (in millivolts or mV), with the effect of particularly massive surficial metal targets represented by spurious negative values.

GPR

As noted above, GPR signal penetration was severely limited by possibly electrically conductive soils or fill material and metallic reinforcing within the numerous concrete pads. Detailed mapping of subtle non-metallic features constituting landfills and disposal pits was not possible using GPR.

Trace and Characterization of Blodgetts Creek

RD4000

The pipe tracing was conducted using a Radiodetection RD4000 digital cable and pipe tracer and transmitter, as described above. Non-metallic pipes such as those containing Blodgetts Creek are traced in one of two ways. A metallic wire or fish-tape is introduced in the pipe at a known access point such as a manway or cleanout. In this application, the transmitter remains stationary and energizes the metallic wire or fish-tape at a frequency selected by the operator (512 Hz, 8 kHz, 33 kHz, or 65 kHz), which is received at the ground surface by the RD4000 locator. Alternatively, the RD4000 can be used to track a miniature, waterproof sonde or "mole" inserted into any accessible pipe by a variety of means – including floating it down a fluid-filled pipe, pushing it through the pipe with flexible fiberglass rods (typically limited to approximately 200 feet of insertion), or hand-carrying it through an evacuated pipe (with proper confined space entry controls). When the transmitter is directly coupled to the wire/fish-tape or tracking the sonde, the RD4000 digital receiver can also calculate the depth of the utility to an accuracy of ±10% of the actual depth of wire/sonde. Please note that depths calculated using these methods indicate the bottom of the pipe.

TW-6

In order to detect and trace the reinforced concrete pipe containing Blodgetts Creek, Enviroscan employed a Fisher TW-6 pipe and cable locator and tracer. As described above, in pipe and cable search mode the TW-6 is essentially a deep-sensing metal detector that detects any highly electrically conductive materials (e.g. metals) by creating an electromagnetic field with a transmitting coil. A receiving coil at a fixed separation from the transmitter measures the field strength. As the instrument is swept along the ground surface, subsurface metallic bodies distort the transmitted field. The change in field strength/orientation is sensed by the receiver, setting off an audible alarm and/or causing deflection of an analog meter. The TW-6 can nominally detect a 2-inch metal pipe to a depth of 8 feet and a 10-inch metal pipe to a depth of 14 feet.

GPR

The severely limited GPR signal penetration depth at this site did not allow for detailed characterization of the size, construction, and depth of the reinforced concrete pipe containing Blodgetts Creek.

Reconnaissance-level Delineation of Suspected NAPL

GPR

The severely limited GPR signal penetration depth (see above) did not allow for delineation of the suspected NAPL.

Results

Boring Clearance

The subsurface utility survey results are shown on Figure 1. Utilities indicated as "Unknown" were identified during a multi-technique "blind" utility search, conducted using the TW-6 in detection mode and the C.A.T. in both Power and Radio modes. GPR scanning was attempted; however, signal penetration was severely limited, possibly due to the presence of conductive soil or backfill material and reinforced concrete pads. Utility traces were marked in the field as the survey progressed using semi-permanent pavement paint. Location control was maintained using DGPS, as described above.

Please refer to Figure 1 for specific limitations and considerations relevant to survey results. In addition, please note that the accuracy of the utility tracing techniques employed for this survey can vary based on many site-specific subsurface conditions (e.g. soil composition, utility geometry and construction, etc.). Therefore, Enviroscan recommends that borings or excavations honor the 18-inch clearance zone for marked utilities as specified by Ohio One Call, and a 3-foot clearance zone for multiple utilities/duct banks (Ibid.).

Detection of disposal trenches, landfills and/or drum caches

The EM survey results are depicted as color contours on Figure 3. Also shown on Figure 3 are some known sources of metal (noted as black diamonds), to aid in the distinction between anomalies resulting from surficial and subsurface metallic sources. Areas of distinctly elevated response are evident, and are enclosed by a black contour line and shaded in purple to red. The reinforced concrete pads covering the surface of most of the southwestern and western portion of the site saturated the instrument, thereby precluding the delineation of metallic objects underneath the concrete pads. Similar areas include the former drum storage pad and current tank farms just north of the main complex, the loading dock area north of Building 48, the area south of Building 48, extending to the tanker enclosure, and areas adjacent to metallic buildings (Buildings 53, 57, 61, 62). Several smaller concrete pads are located throughout the site and also appear as large regions of elevated response. These are located on the eastern and southern portions of the site.

The large linear grouping of anomalies encompassing most of the eastern border of the site (trending northeast-southwest) may be related to the historic rail system associated with the plant. Although the anomalies present themselves as possible surficial metal (large negative numbers – yellow to orange shading), the observed surficial metal and existing buildings in that area could not cause such an areally extensive response. Furthermore, the anomalies continue north of the facility into Dibble Park where there is no observed surface material. The linear trending anomalies are suspect and should be treated as the result of subsurface material.

As described above, areas of distinctly elevated response are evident, and are enclosed by a black contour line and shaded in purple to red. Discrete anomalies or targets can best be seen on the northeastern portion of the site. Several clusters of targets can also be seen, labeled A-C in Figure 3. Clusters such as these that are comprised of a few discrete targets intermingled in an area of generally elevated response may indicate a disposal or landfill area. One portion of the southern part of the site, comprising the former location of Buildings 1B, 1A, and 2, also shows a small cluster of anomalies, labeled D, possibly related to the destruction of those buildings. Further investigation of the areas and discrete targets discussed above with respect to subsurface metallic bodies is recommended.

The client representative onsite inquired particularly about the verification of several known underground storage tanks (USTs) onsite. The locations are noted on the inset of Figure 3 in red. UST F appears to be located east of Buildings 53/57. The verification of USTs D and E is inconclusive due to the saturated EM responses in the surrounding area, masking any subsurface targets. UST C is located under a reinforced concrete pad and is not visible on the EM-61 data. UST B is apparently located underneath a parked trailer, and therefore not accessible. UST A is supposedly located east of Building 48 and is not apparent in the EM survey results.

As noted above, the use of GPR to further delineate subsurface utilities, landfills, and disposal pits was severely limited by the apparent presence of widespread, electrically conductive material underlying the site. A site-wide grid search was not feasible considering these conditions; therefore, that portion of the GPR investigation was not performed.

Trace and Characterization of Blodgetts Creek

Several techniques, including GPR, EM metal detection, and active line tracing with the RD4000, were used to trace portions of Blodgetts Creek. As noted above, GPR signal penetration depth was severely limited; therefore, characterization of the depth, width, and trace of the pipe containing the creek with GPR was not possible. The large diameter of the concrete pipe (approximately five feet) limited the length that the tracing wire or sonde could be inserted into the pipe (without folding over on itself) to approximately 30 to 60 feet from each access point (labeled BD1-4 in Figures 2 and 3). The length of the creek east of BD4 (see Figure 3) was overlain by grass and soil; in these areas the TW-6 metal detector was used successfully to trace the pipe containing the creek. Partial confirmation of the TW-6 trace is shown in the EM-61 data in Figure 3. Question marks denote ends of traces (just east of Building 48), beyond which no technique was successful in continuing the trace. The section between BD1 and BD2 could not be traced due to its length and location under reinforced concrete; however, acoustic confirmation indicates that the pipe does track from BD1 to BD2. Inspection of the EM-61 data shows one possible route between BD1 and BD2 (see Figure 3). Some structural information was recorded at each access point (excluding BD1 due to lack of visibility) and is included the following table:

Access Point	Depth to Invert	Depth to Bottom
BD 2	3’ 9”	8’ 5”
BD 3	3’ 7”	8’ 4”
BD 4	3’ 8”	8’ 3”

Reconnaissance-Level Delineation of Suspected NAPL

The severely limited GPR signal penetration depth (noted above) did not allow for detailed characterization or delineation of the suspected NAPL.

Limitations

The geophysical survey described above was completed using standard and/or routinely accepted practices of the geophysical industry and equipment representing the best available technology. Please also note that the survey data are based on site conditions at the time of the geophysical investigation. Enviroscan does not accept responsibility for survey limitations due to inherent technological limitations or unforeseen site-specific conditions. However, we make every effort to identify and notify the client of such limitations or conditions.

We appreciate this opportunity to have worked with you again. If you have any questions, please do not hesitate to contact the undersigned.

Sincerely,
Enviroscan, Inc.

William E. Steinhart III, M.Sc.
Geophysics Project Manager

Technical Review By:
Enviroscan, Inc.

Felicia Kegel Bechtel, M.Sc., P.G.
President

enc.: Figure 1: Borehole Clearance Map – Areas of Proposed Boring and Soil Samples
Figure 2: EM-61 Survey Data Coverage
Figure 3: EM-61 Differential Response Data Contours

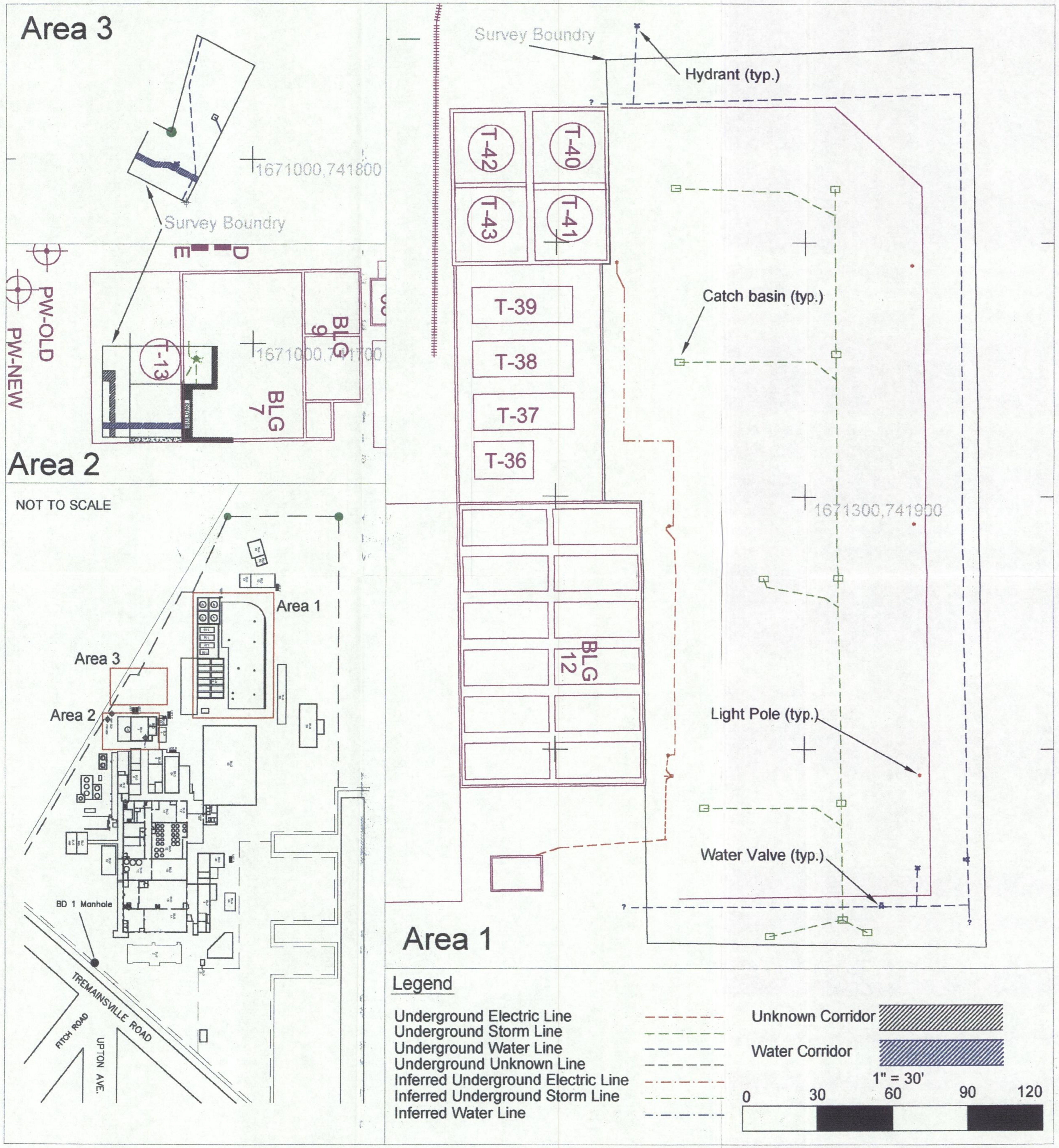

Figure 1

Borehole Clearance Map
Areas of Proposed Boring and Soil Samples

Dupont Automotive Parts Plant
Toledo, Ohio

Enviroscan, Inc.
Project No. 090204a
Rev. 10/14/02

ENVIROSCAN, INC.

North

Notes:

Coordinates in Ohio State Plane Grid NAD 83 Datum. Grid node spacing is 100 feet.

Basemap "Sewerline(Enviroscan).dwg" supplied by URS Diamond Inc.

Utility locations from DGPS survey by Enviroscan, Inc.

Please note that the utility locations shown on this map are schematic, with a horizontal error of +/- 3 feet.

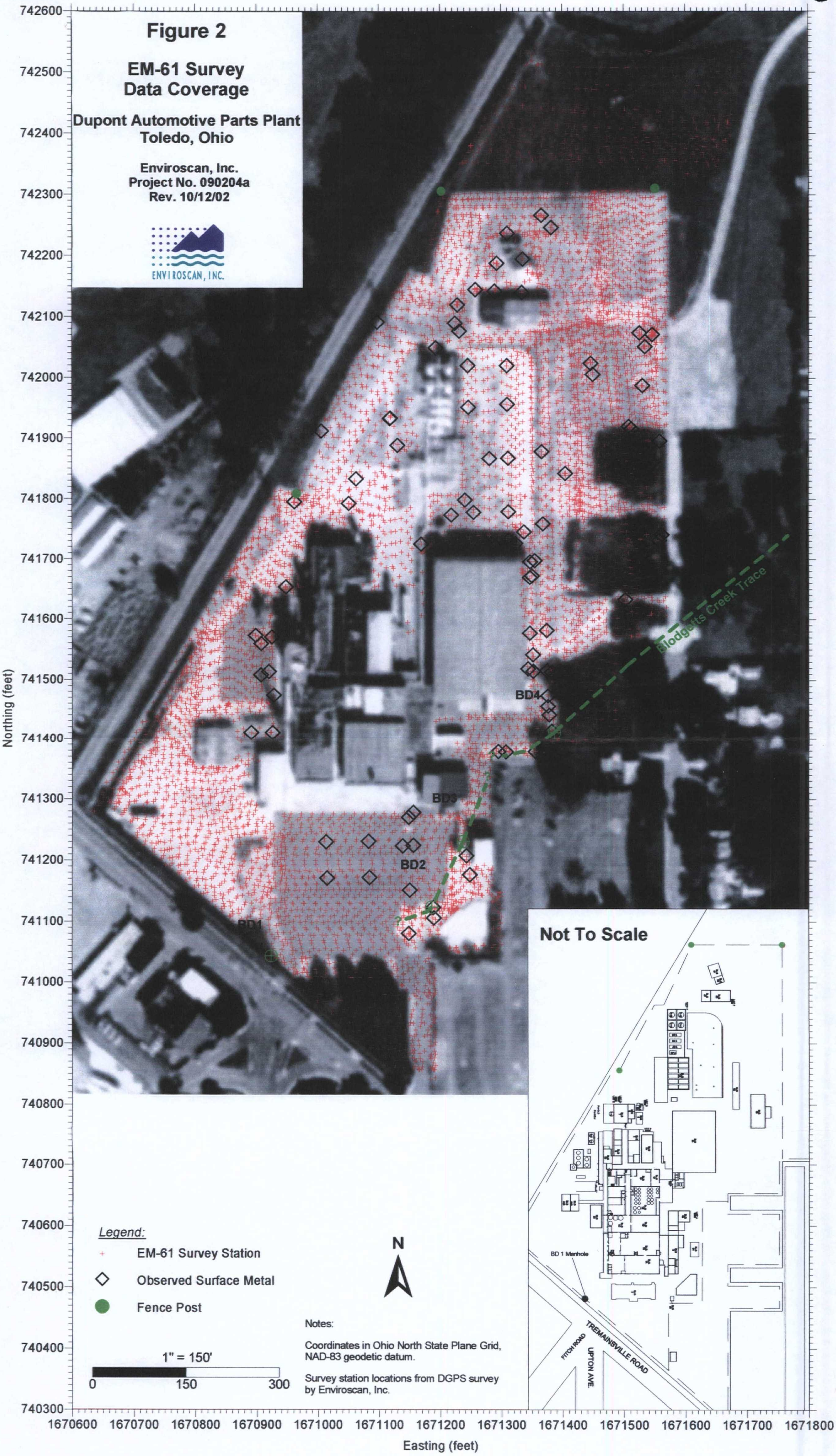

Figure 2

EM-61 Survey Data Coverage

Dupont Automotive Parts Plant Toledo, Ohio

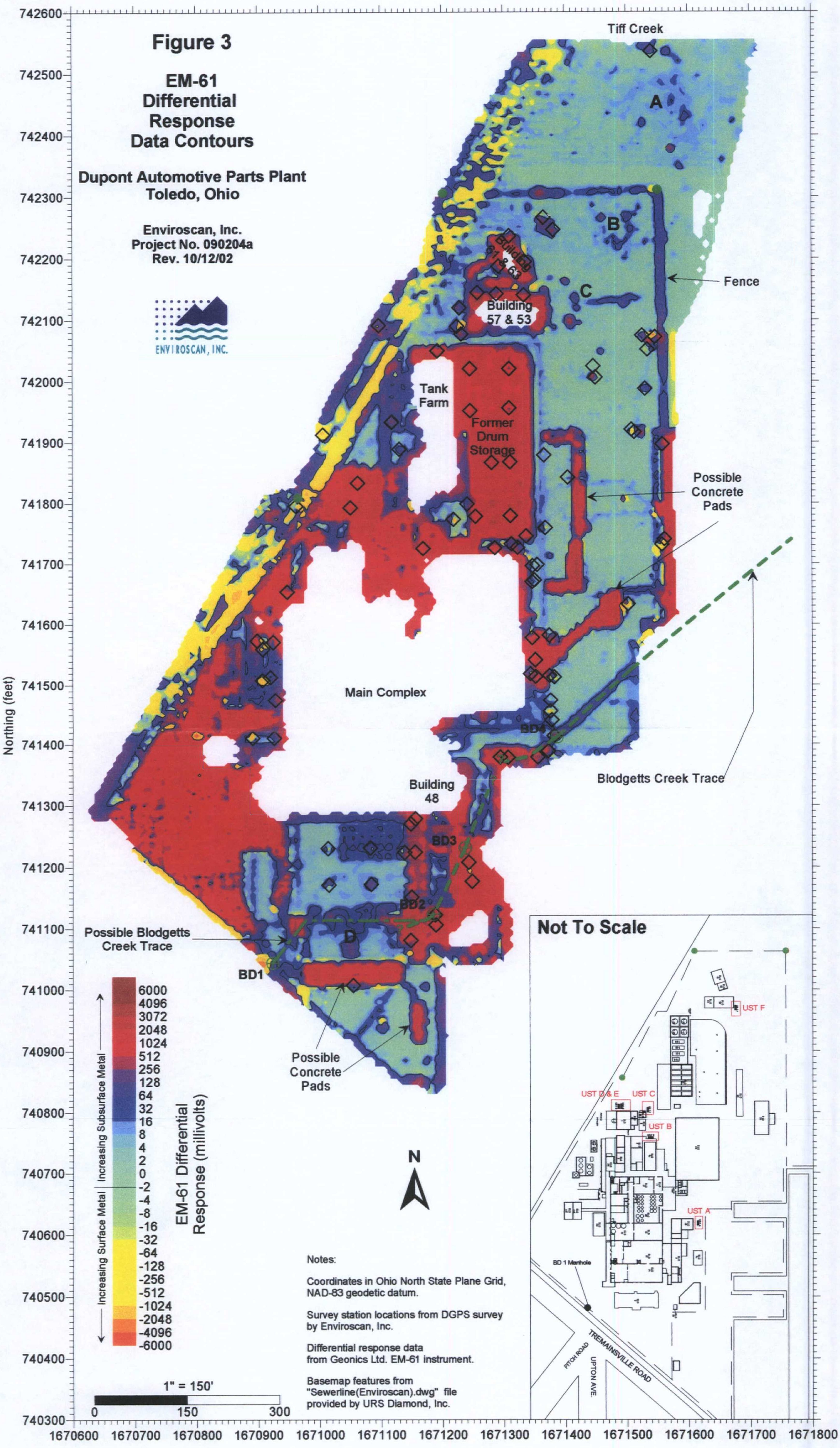

Figure 3
EM-61 Differential Response Data Contours
Dupont Automotive Parts Plant
Toledo, Ohio
Enviroscan, Inc.
Project No. 090204a
Rev. 10/12/02
ENVIROSCAN, INC.
Tiff Creek
A
B
C
D
Fence
Building 57 & 53
Tank Farm
Former Drum Storage
Possible Concrete Pads
Main Complex
Building 48
BD1
BD2
BD3
BD4
Blodgetts Creek Trace
Possible Blodgetts Creek Trace
Possible Concrete Pads
EM-61 Differential Response (millivolts)
Increasing Subsurface Metal
Increasing Surface Metal
6000
4096
3072
2048
1024
512
256
128
64
32
16
8
4
2
0
-2
-4
-8
-16
-32
-64
-128
-256
-512
-1024
-2048
-4096
-6000
1" = 150'
0
150
300
N
Notes:
Coordinates in Ohio North State Plane Grid, NAD-83 geodetic datum.
Survey station locations from DGPS survey by Enviroscan, Inc.
Differential response data from Geonics Ltd. EM-61 instrument.
Basemap features from "Sewerline(Enviroscan).dwg" file provided by URS Diamond, Inc.
Not To Scale
UST F
UST D & E
UST C
UST B
UST A
BD 1 Manhole
TREMAINSVILLE ROAD
PITCH ROAD
UPTON AVE.
Northing (feet)
742600
742500
742400
742300
742200
742100
742000
741900
741800
741700
741600
741500
741400
741300
741200
741100
741000
740900
740800
740700
740600
740500
740400
740300
Easting (feet)
1670600
1670700
1670800
1670900
1671000
1671100
1671200
1671300
1671400
1671500
1671600
1671700
1671800

ENVIROSCAN, INC.®

Final Report
Phase II Geophysical Survey
Shallow Sand Thickness Mapping
DuPont Automotive Products
Toledo, OH
Enviroscan Project Number 090204b Revised

Prepared For: URS-WC Diamond
Prepared By: Enviroscan, Inc.
October 15, 2002

MARINE SEARCH AND SURVEY
a division of ENVIROSCAN, INC.

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ENVIROSCAN, INC.

October 15, 2002

Mr. Larry T. Reitz
URS-WC Diamond
Barley Mill Plaza
Building 27
Wilmington, DE 19880-0027

RE: Phase II Geophysical Survey
Shallow Sand Thickness Mapping
DuPont Automotive Products
Toledo, OH
Enviroscan Project Number 090204b Revised

Dear Mr. Reitz:

Pursuant to our revised proposal dated September 5, 2002, Enviroscan, Inc., has completed a seismic refraction survey of the above-referenced site. The following report, figures, and appendices detail the methods and results of the survey.

Background and Purpose

The site is occupied by a Dupont Automotive Parts Facility that produces resins for the automotive industry. Historically, this plant also produced paint for use in the automotive industry. The purpose of the survey was to map the thickness of a shallow surficial sand layer that may be involved in the transportation of contaminants from the facility to the nearby Blodgetts and Tiff Creeks. According to information supplied by URS WC Diamond, the site is underlain by the Greenfield Dolomite at depths of approximately 80 to 90 feet below land surface. The Greenfield Dolomite is typically a stromatolitic brown dolomite with bituminous partings and stylolites. Approximately 70 to 80 feet of glacial drift overlies the Greenfield Dolomite. The drift consists mainly of silt and clay, and also contains lenses of lacustrine beach sands. Ten to twenty feet of lacustirne sediments consisting mainly of silt and clay overly the glacial till (URS WC Diamond).

Methods

In order to satisfy the survey purpose, Enviroscan completed a seismic refraction survey between September 24 and 27, 2002. Seismic refraction is used to perform profiling of the subsurface density contrasts between strata with differing mineralogy or degree of compaction. The principles of the seismic refraction technique are described in the accompanying Introduction to Seismic Refraction (Appendix A). In summary, seismic refraction generally involves measuring the travel times of shock waves from a surface source or shot point, down to the top-of-bedrock (or other density contrast), and back to an array of ground motion sensors or geophones at the surface (see also Redpath, 1973).

For this survey, a Geometrics Smartseis seismograph was used to record seismic travel times at linear arrays of Mark Products 4.5 Hertz geophones spaced at constant 5-foot intervals along six seismic lines (see blue inverted triangles, Figure 1). The closely spaced geophones ensure optimal data coverage at shallow depths, within the target interval for detection of shallow sand. Travel times were recorded for shot points located at several locations: 50 feet and 10 feet off the end of each seismic array, and in the middle of each array where the ground cover was not concrete. This provides multi-fold, reversed seismic data capable of resolving potentially undulating density contrasts and/or lateral velocity changes. This geometry was designed to minimize plate waves, a common occurrence in areas where the ground cover is mainly concrete. Plate waves are essentially seismic waves that travel within the concrete slab, rather than down into the subsurface, and cause undesired noise in the data. At each shot point (see red star burst symbols, Figure 1), seismic waves were generated by repeated blows of a 27-pound airless jackhammer. Seismic waveform data were recorded on the internal hard drive of the seismograph. Note that the original seismic waveform data are on permanent file in digital format at Enviroscan for third-party review or further interpretation if necessary.

The location of each shotpoint was digitally recorded using a backpack-mounted Trimble Pathfinder GPS receiver in contact with six to eight position-fixing satellites. The GPS positions were post-processed and differentially corrected using data from a fixed community base station in Brighton, MI. The resulting differential GPS (DGPS) positions have an accuracy of better than 3 feet. The elevations of selected shot point locations were surveyed using a rod and optical level. The seismic survey shot point locations are depicted on Figure 1.

Mr. Reitz
October 15, 2002
Page 3

The seismic refraction field data were analyzed using the software packages SIP by Rimrock Geophysical and SeisOPT Pro by Optim Software. First arrival travel times or first breaks were selected on the waveform data using the automatic picking routine SIPIK (with occasional manual adjustment) to ensure consistent and objective picking. From the first arrival times and geophone locations, T-X graphs (see Appendix A) were compiled for each line using the routine SIPIN. The T-X data were subjected to a mathematical inversion using SeisOPT Pro to determine the statistically best-fitting velocity distribution beneath each seismic line. Figure 1 presents the best-fitting cross-sectional model for each seismic profile, presented with along-profile distances versus depth below land surface (bls). Figure 1 also displays a plan view map inset in which all the seismic lines are oriented such that the beginning of each line is the southernmost point of each line, with profile distance increasing to the north. On the cross-sections, the seismic velocity of the subsurface material is color-contoured, with selected velocity contours highlighted to provide approximate layer boundaries. The velocity ranges labeled on the color scale legend are consistent with typical published velocities for earth materials (e.g. Redpath, 1973).

Results

The seismic profiles shown on Figure 1 depict a velocity structure consistent with the presence of a surficial layer of varying thickness with low velocity (<3000 feet per second or fps) consistent with poorly compacted soil, sand, and/or backfill (Redpath, 1973). Deeper material with a velocity of 3000 to 4500 fps is consistent with unconsolidated sediments or residual soils, which become more dense (higher velocity) with depth/overburden pressure. The results of all of the seismic profiles are consistent with unconsolidated material of the type expected in this geological setting.

The seismic velocity profiles shown on Figure 1 indicate a low velocity layer (shaded blue to green) that deepens to the east (from Line 2 to Line 4), as well as to the north from near the middle of Lines 1 and 2. Lines 1, 3, and 4 indicate a layer with the same velocity range, also deepening to the south. The seismic velocity profiles of Lines 5 and 6 show the same low velocity layer, with little change in the thickness from that seen along Line 1. The low velocity layer is absent from the southern portion of Line 2.

The seismic refraction surveys along the southern portions of Lines 1 and 2 do not appear to have as great a depth of investigation as seen along the remaining lines. Effective survey depth in these regions appears to be limited to approximately 10 to 15 feet below land surface. This is likely due to a highly refractive layer which effectively created a blind zone beneath it with a thickness of 5 feet, and inhibited detection of anything below 20 feet (as modeled from the seismic array geometry using Refrmodl by Spectrum Geophysics). The origin of this layer is not known; however, the overall horizontal nature of the layer suggests that it is an artifact unique to the site, such as an historic ground surface of the facility compacted by usage and later overfilled.

The seismic refraction data described above cannot clearly distinguish between backfill, unconsolidated soil or sand lenses, due to the similarities in their densities. The shallow low velocity layer described above could be made up of the target sand member, or it could be an amalgam of the sand lenses, backfill, and unconsolidated material known to be present beneath the site. Comparison of the seismic refraction data with the shallow sand isopach maps and the boring logs supplied by the client (not shown in Figure 1) shows that in the area north of the main complex (where the sand isopach map has been compiled), the low velocity layer deepens to the north, as does the shallow sand layer; however, the refraction data also show the low velocity layer deepening to the south (seen along Lines 1, 3, and 4), where there are no data available for comparison.

The seismic refraction data clearly shows a shallow low velocity layer underlying the site and deepening to the north and south. Further geotechnical information such as borings coincident with the seismic refraction lines may better constrain the geologic components of the low velocity layer discussed above.

Limitations

The geophysical survey described above was completed using standard and/or routinely accepted practices of the geophysical industry and equipment representing the best available technology. Please also note that the survey data are based on site conditions at the time of the geophysical investigation. Enviroscan does not accept responsibility for survey limitations due to inherent technological limitations or unforeseen site-specific conditions. However, we make every effort to identify and notify the client of such limitations or conditions.

We appreciate this opportunity to have worked with you again. If you have any questions, please do not hesitate to contact the undersigned.

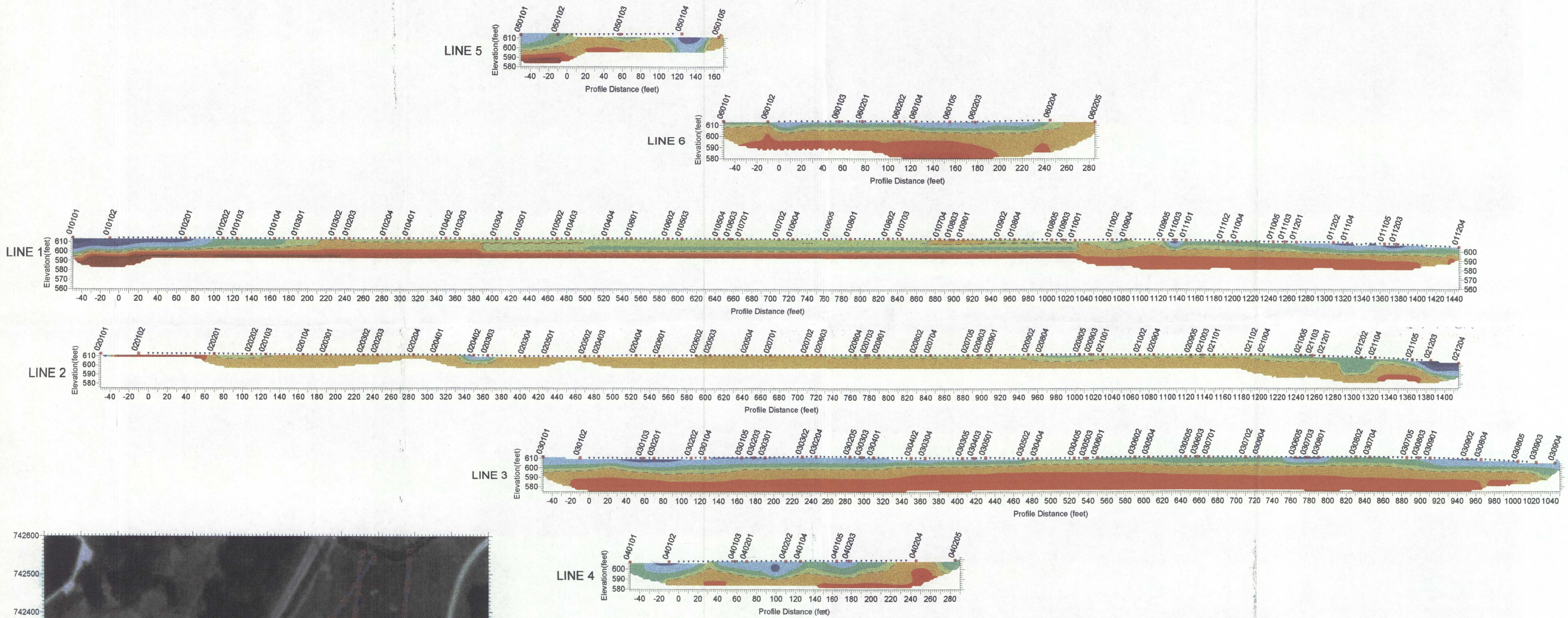
Sincerely,
Enviroscan, Inc.

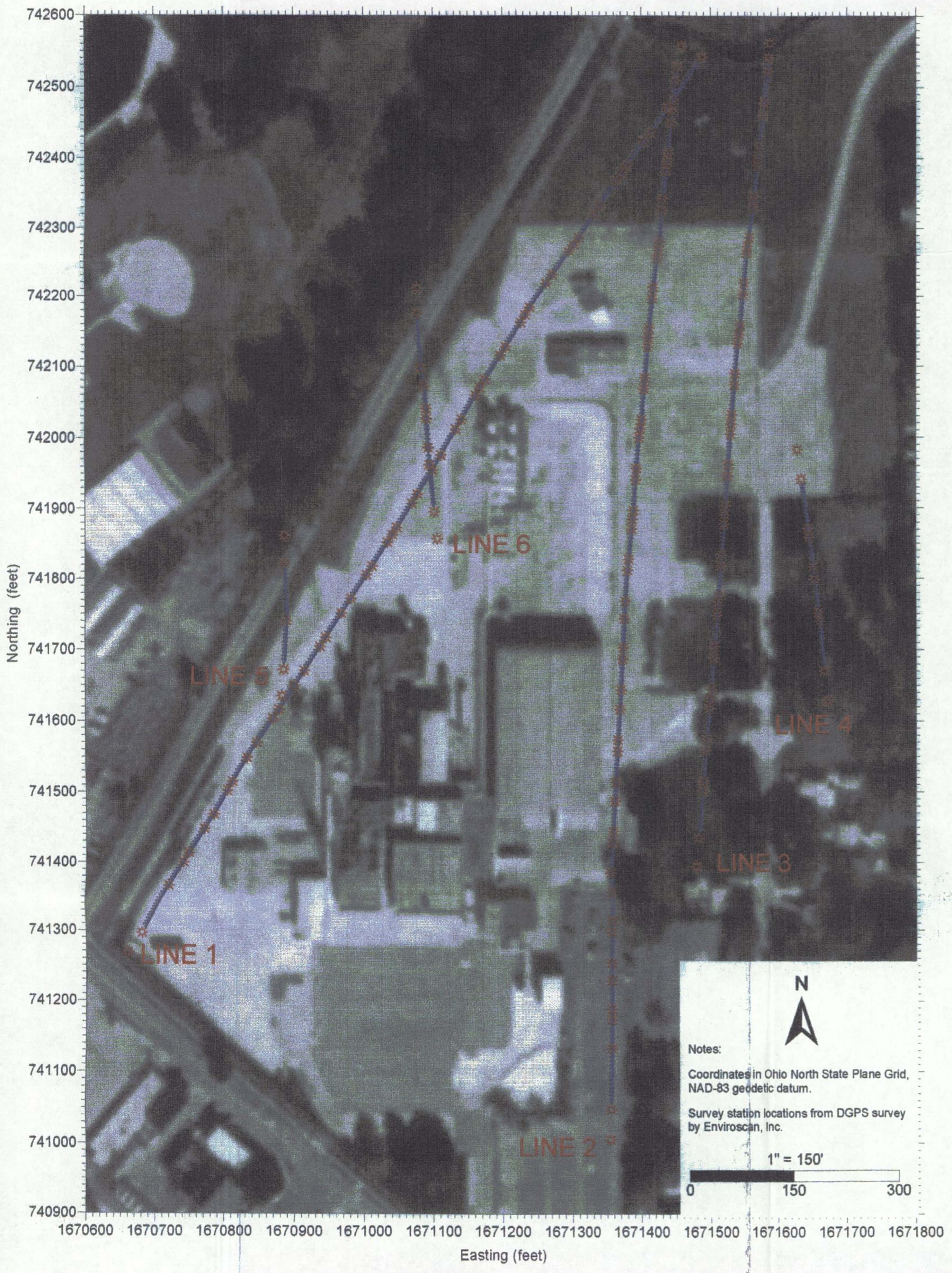
William E. Steinhart III, M.Sc.
Geophysics Project Manager

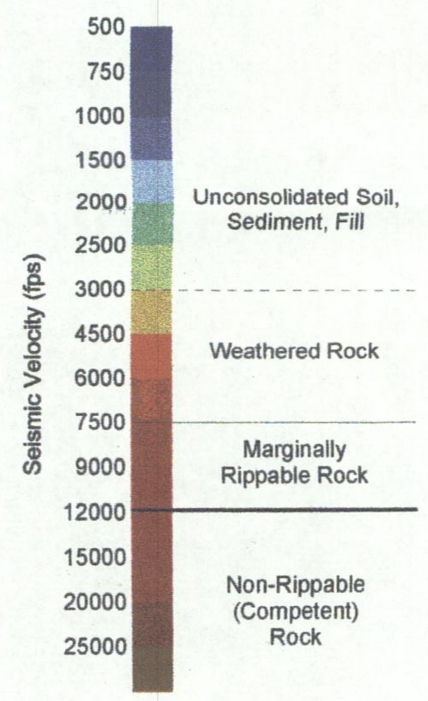
Technical Review By:
Enviroscan, Inc.

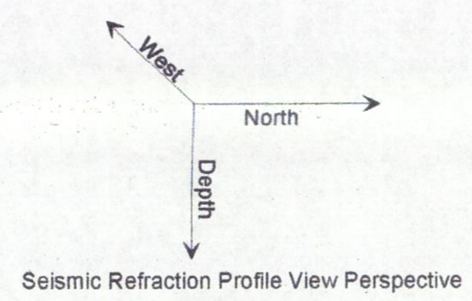
Felicia Kegel Bechtel, M.Sc., P.G.
President

enc.: Figure 1: Seismic Velocity Profiles
Appendix A: Introduction to Seismic Refraction
References









Notes:

Data from refraction survey using Geometrics Smartseis S-24.

Seismic velocity profiles from globally optimized inversion using SeisOpt Pro by Optim Software.

Legend

Seismic Shot Point

010205 Seismic Shot Label

Geophone Location

1"=60'

0 60 120 180 240

Figure 1

Seismic Velocity Profiles

Dupont Automotive Parts Plant
Toledo, Ohio

Enviroscan, Inc.
Project No. 090204b
Rev. 10/17/02

ENVIROSCAN, INC.

Appendix A

Introduction to Seismic Refraction

1051 Columbia Avenue • Lancaster, Pennsylvania 17603 • 717/396 8922 • Fax 717/396 8746 • email@enviroscan.com • www.enviroscan.com

Introduction to Seismic Refraction

by

Timothy D. Bechtel, Ph.D., P.G.

Energy

Mechanical elastic (seismic) waves generated by a hammer blow, weight drop, or explosion.

Sensitivity

Sensitive to elastic properties or moduli – generally strongly correlated with density.

Basic Equipment

Recording Seismograph (generally 24 or more channels); Geophones (one for each channel); Geophone cable; Hammer or weight plus strike plate or explosives; Trigger switch.

Common Applications

Determination of the depth and dip of soil horizons and bedrock surfaces. Recent processing advances allow some detection and delineation of discrete targets.

Principles

In a uniform isotropic earth, the shock wave from a blow or explosion at the surface travels outward and downward in a hemispherical wave front like a three-dimensional ripple from a pebble in a still pond. At any point on the wave front, a straight line from the shock source to the wave front depicts the path of the seismic wave, and is called a ray path (see Figure SR-1). In reality, there are several independent shock waves; the fast-moving primary, compressional or P wave front; the slower moving secondary, shear or S wave (both of which form hemispherical wavefronts); and several disk-like wave fronts that travel only along the surface of the earth (called surface waves or ground roll). For the purposes of most seismic refraction surveys, only the fastest moving wave front — the P wave — is considered. S-wave refraction is used in selected circumstances where complete determination of elastic moduli is desired – particularly when it may be desirable to eliminate the effects of water saturation.

In a layered earth, the hemispherical P shock wave defined by the radially distributed P ray paths are deflected according to the laws of optics (Snell's Law) at interfaces between materials with differing seismic velocities (i.e. densities or elastic properties). Figure SR-2 depicts the deflection of ray paths due to an increase in P velocity at a bedding plane. The type of deflection that a ray path will undergo is dependent upon the angle at which it strikes the interface, and falls into one of four categories:

1) Some direct rays (green in Figures SR-2 and SR-3) travel parallel to the ground surface at the seismic velocity of the upper layer, do not strike the underlying interface, and consequently are not deflected.

2) Reflected rays (purple in Figures SR-2 and SR-3) arise where direct rays strike the interface, and a portion of the energy is reflected symmetrically back towards the surface.

3) The portion of the energy of the incident direct wave that is not reflected upward is refracted, or bent as it crosses the interface – making refracted waves in the lower layer (red in Figures SR-2 and SR-3).

4) At a precise angle called the critical angle, the incident ray is refracted directly along the interface, and travels at the higher seismic velocity of the lower layer (see Critically Refracted Wave in Figure SR-3). As this critically refracted or head wave races along beneath the interface, it generates a secondary elastic disturbance that travels back to the surface along ray paths that define a wave front analogous to the bow wake of a ship. These returning rays again travel at the slower velocity of the upper layer.

To perform a refraction survey, a linear array of ground motion sensors or geophones is spaced out from the seismic source or shot point, forming a geophone spread. Each geophone is connected to a separate channel in a seismograph which records a wiggle trace representing the ground motion resulting from the passage of the various seismic rays.

As depicted in the time-distance (T-X) curve in Figure SR-4, the layered earth structure can be determined by analyzing the seismographic wiggle traces. At distances close to the seismic source, the first wiggle or ground motion (the first arrival after the shot) is due to passage of the direct wave travelling at the velocity of the upper layer. Reflected waves arrive later since they have by definition traveled a greater distance at the same velocity (additional later wiggles are caused by passage of the more slowly travelling S and surface waves). Beyond a distance dictated by the critical angle, the first arrival of seismic energy represents the head wave of the critically refracted ray. These refracted rays also by definition travel a greater distance than the direct wave. However, along part of their path, they have traveled at the higher velocity of the underlying more consolidated layer. At greater distances from the shot point, where the path length in the higher velocity layer becomes significant, the head wave arrivals actually race past the direct wave and become the first arrival (see labeled crossover in Figure SR-4). By extension, it can be shown that if a third layer with even greater velocity lies at greater depth, the head wave from this layer will become the first arrival at a sufficient distance from the shot point.

In conventional seismic refraction, only the first P wave arrivals can be reliably selected on a wiggle trace record. The later reflected P wave arrivals are generally obscured by the slower-travelling S and surface waves, and the very slow air blast or sound wave from the shot. To interpret a seismic refraction record, the first arrival travel times are measured for each wiggle trace and plotted at the appropriate point on a time-distance (T-X) curve (see Figure SR-4). In a plane-layered earth, these first arrivals define a series of line segments, each representing a discrete layer. The seismic velocity of each layer is simply the reciprocal of the slope of the associated line segment. The thickness of each layer can be calculated from the distances where the line segments intersect. The mathematics for these calculations are easily derived, and can be found in any introductory geophysics text.

True geologic strata are rarely perfectly horizontal. The effect of a dipping interface on a travel time curve cannot be recognized using a single shot point. Calculations based on a T-X curve from a single shot point should always be considered as producing apparent depths to interfaces and apparent seismic velocities for all but the uppermost layer. To determine the true depths and dips of interfaces and the true seismic velocities, it is necessary to reverse the seismic line; that is, move the shot point to a location at or beyond the farthest geophone in the spread, and repeat the shot. The calculation of true depths, dips and velocities from reversed seismic lines is also readily performed.

Capabilities

Conventional seismic refraction can yield accurate measurements of depths and attitudes of soil horizons, groundwater tables, and other relatively distinct and planar strata. Modern computer analysis of multi-fold seismic refraction data (i.e. with many and overlapping shot points) can provide delineation of undulating or even irregular (as opposed to simply planar) interfaces. The latest generation of computer processing techniques require very high-fold data, but in favorable conditions, are capable of resolving even discrete targets such as foundation elements, tunnels or cavities, and can resolve gradational boundaries as well as distinct interfaces. The seismic P-wave velocities of materials are generally an indication of relative density or compaction. S-wave refraction data (collected using specialized geophones, shock sources and field procedures) can provide S-wave velocities that bear a well-constrained empirical relationship to standard penetration test (SPT) N values and therefore bearing capacity. For surveys where matching P- and S-wave velocities are determined, the dynamic elastic moduli of subsurface materials can be calculated (including Poisson's Ration, Young's or Bulk Modulus, and Shear Modulus or Rigidity).

Limitations

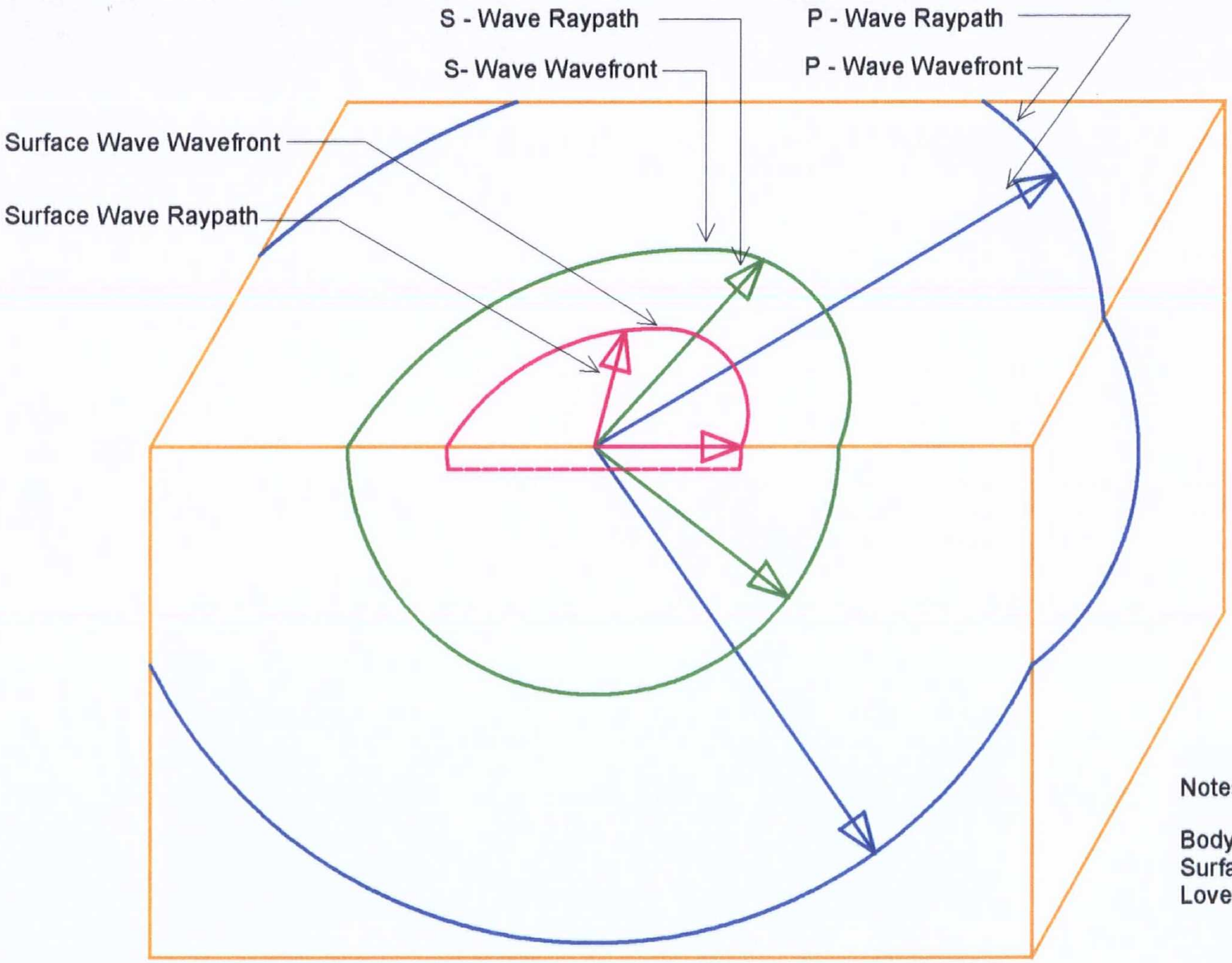
Seismic data is collected at spaced geophones, and therefore does not provide continuous profile data. If geophones are spaced too widely, thin layers can be missed entirely.

Conventional refraction interpretations are only accurate where the velocity of strata increase with depth. Velocity inversions not only alter the data, but are particularly insidious since the presence of a low velocity zone at depth is not apparent in first arrival data. The latest generation of computer processing techniques do allow detection and delineation of laterally restricted low velocity zones (e.g. tunnels, cavities, gravel lenses, etc.).

Sharp or dramatic interface relief such as limestone pinnacles cannot always be resolved even with very tight geophone spacing. Therefore, refraction profiles of expectedly irregular interfaces should be assumed to represent somewhat smoothed versions of actual relief (see e.g. Figure SR-5).

Seismic records can contain noise due to heavy machinery vibrations, vehicular traffic, and sometimes even wind or distant earthquakes. Care must be taken to identify potential sources of seismic noise prior to beginning a survey.

The effective survey depth is limited to approximately 1/5 of the greatest shotpoint to geophone distance. Therefore, very deep surveys may require impractically long lines (requiring consideration of other geophysical techniques such as seismic reflection).



Notes:

Body Waves consist of P and S waves. Surface Waves consist of Rayleigh and Love waves.

Figure SR-1 **Seismic Wave Types** **Rev. 01/2001**

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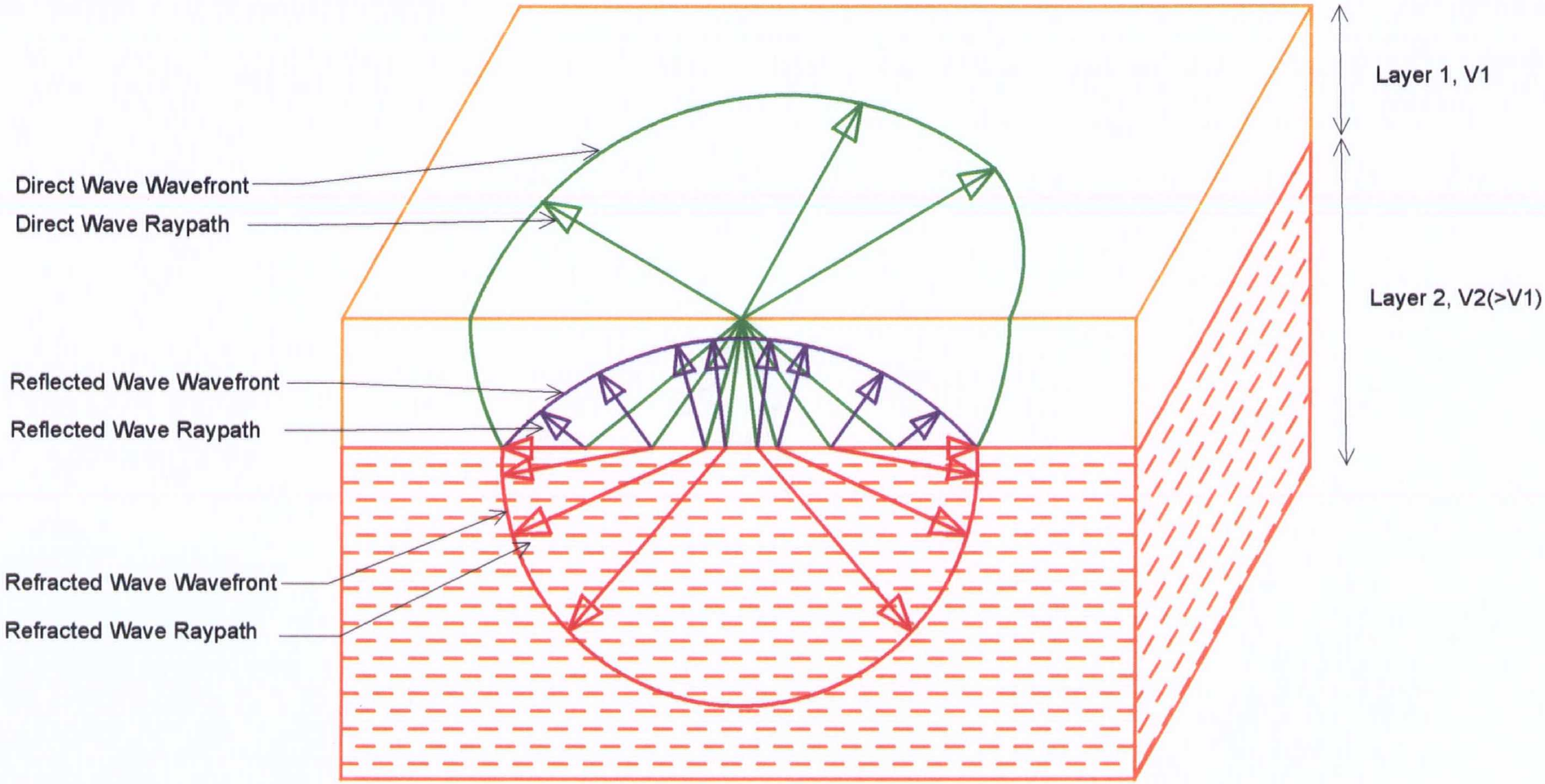

Figure SR-2

Effect of Layering on Body Wave Raypath

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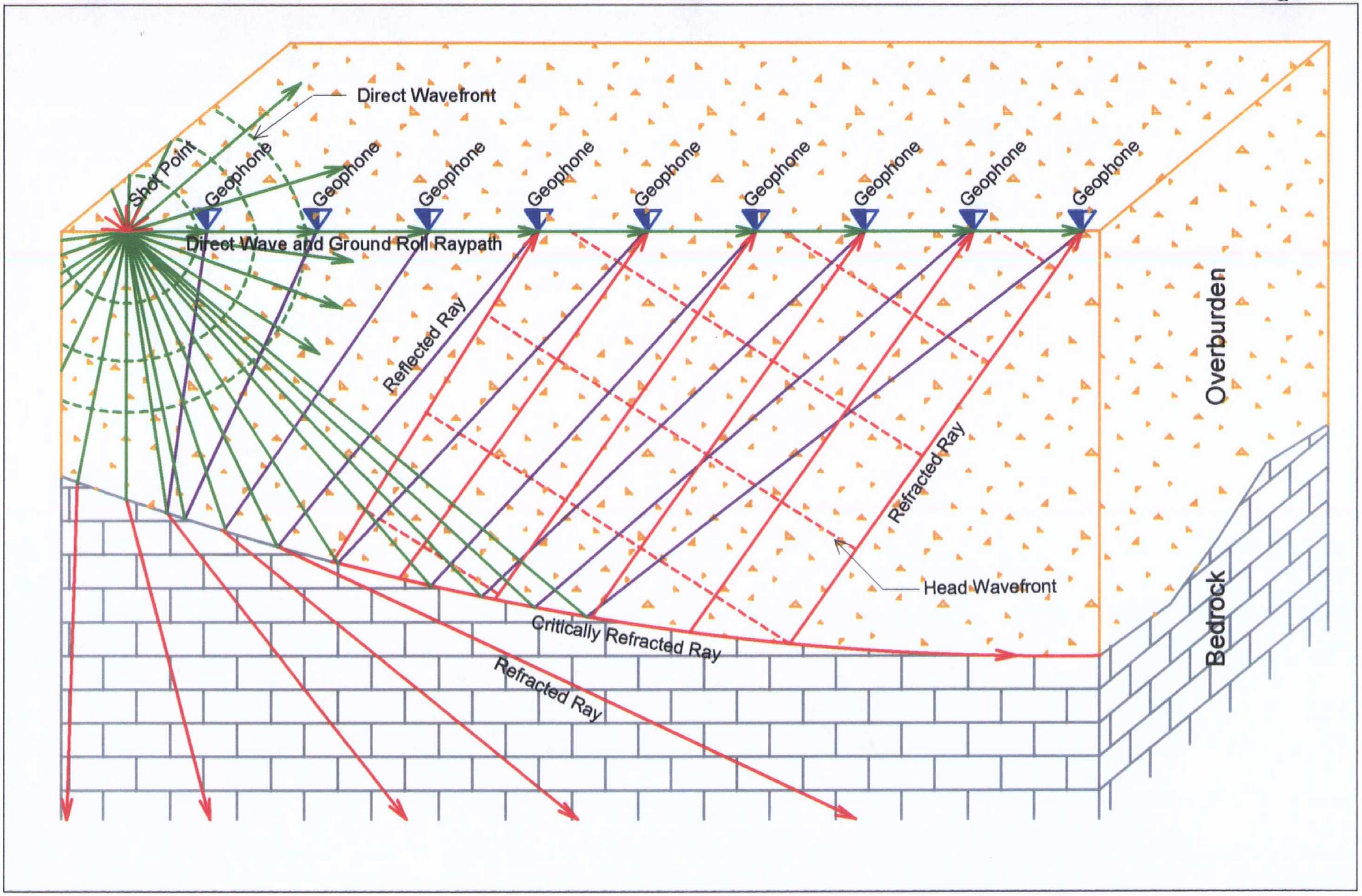

Figure SR-3 **Seismic Ray Path Geometry** **Rev. 01/2001**

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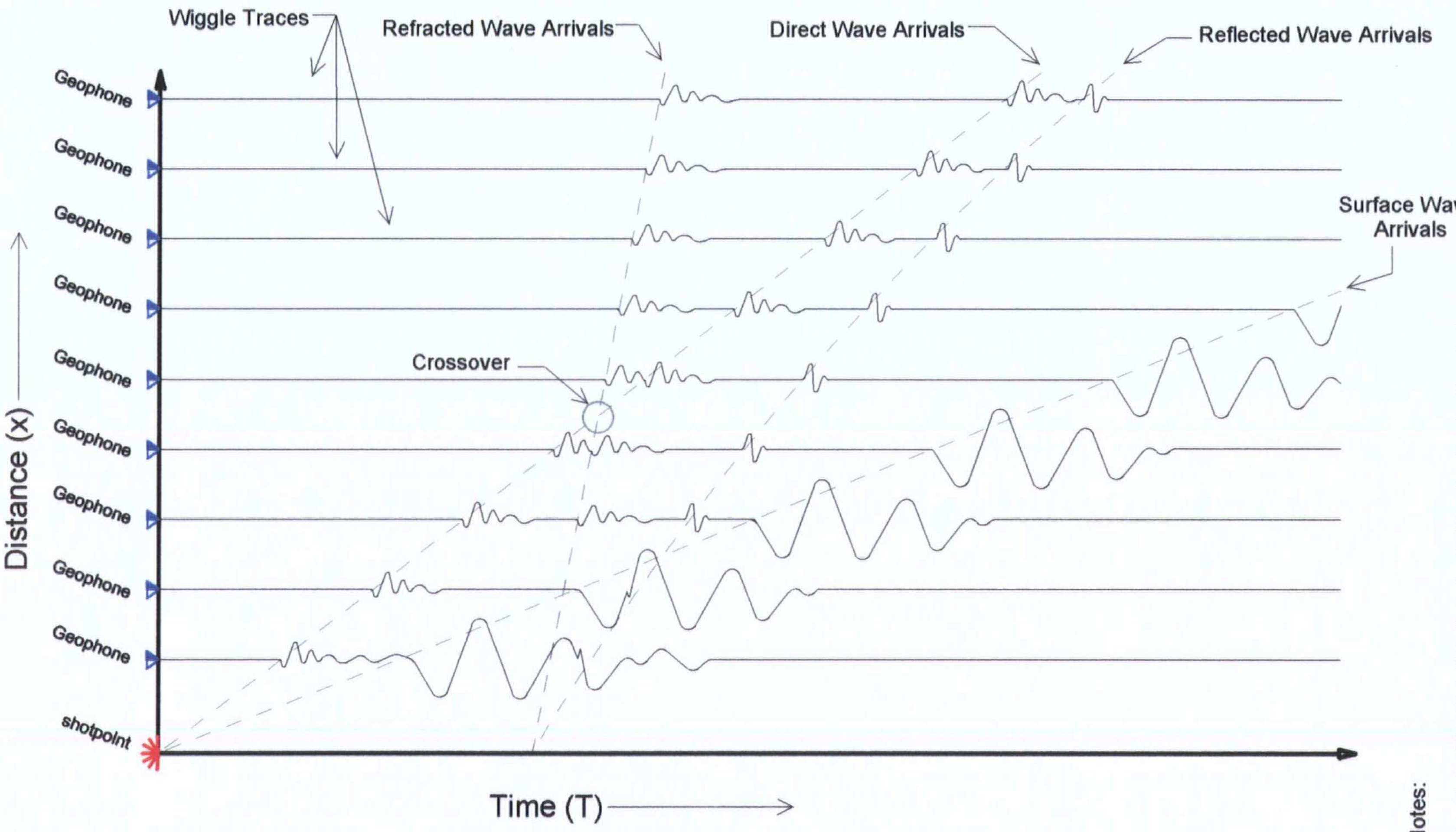

Notes:

S-wave arrivals (direct, reflected and refracted) not shown.
Seismic noise not shown.

Figure SR-4

Idealized Seismic Record and T- X Graph

Rev. 01/2001

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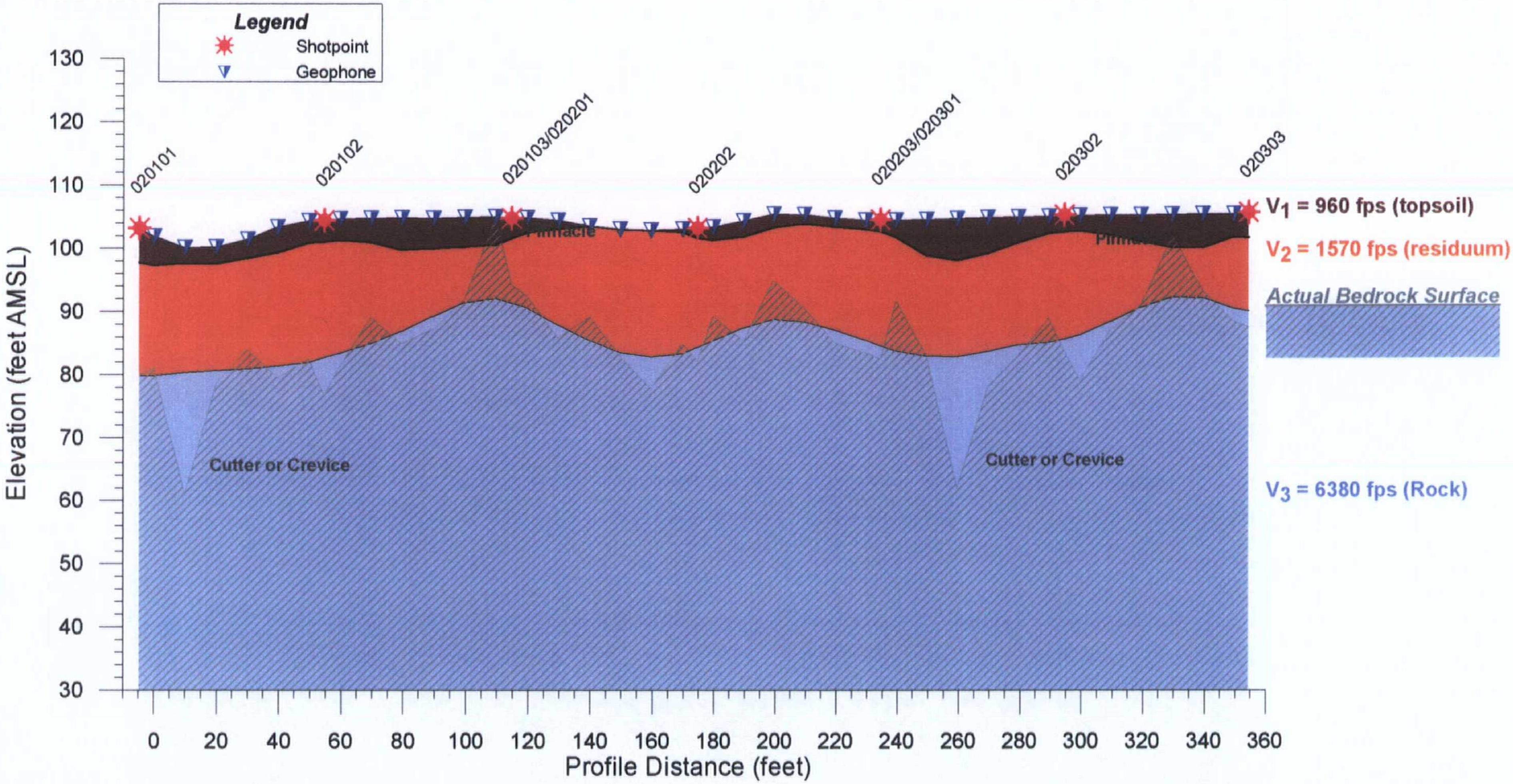

Figure SR-5 **Example Karst Terrane Seismic Profile** Revised 01/2001

ENVIROSCAN, INC.

References

Redpath, B. B. (1973) Seismic Refraction Exploration for Engineering Site Investigations, U.S. Army Corps. of Engineers, Technical Report E-73-4.

ENVIROSCAN, INC.®

Final Report
Phase III Geophysical Survey
Boring Location Clearance, and
Geophysical Well Logging
DuPont Automotive Products
Toledo, OH
Enviroscan Project Number 090204c

Prepared For: URS-WC Diamond
Prepared By: Enviroscan, Inc.
December 30, 2002

MARINE SEARCH AND SURVEY
a division of ENVIROSCAN, INC.

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ENVIROSCAN, INC.

December 30, 2002

Mr. Larry T. Reitz
URS-WC Diamond
Barley Mill Plaza
Building 27
4417 Lancaster Pike
Wilmington, DE 19805

RE: Phase III Geophysical Survey
Boring Location Clearance, and Geophysical Well Logging
DuPont Automotive Products
Toledo, OH
Enviroscan Project Number 090204c

Dear Mr. Reitz:

Pursuant to our revised proposal dated September 5, 2002, Enviroscan, Inc., has completed a multi-technique geophysical survey of the above-referenced site. The following report and figures detail the methods and results of the survey.

Background and Purpose

The site is occupied by a Dupont Automotive Parts Facility that produces resins for the automotive industry. Historically, this plant also produced paint for use in the automotive industry. The purposes of this survey were to:

1) provide utility clearance for two proposed borings or geoprobes, and

2) perform geophysical well logging of two previously-found production wells.

According to information supplied by URS WC Diamond, the site is underlain by the Greenfield Dolomite at depths of approximately 80 to 90 feet below land surface. The Greenfield Dolomite is typically a stromatolitic brown dolomite with bituminous partings and stylolites. Approximately 70 to 80 feet of glacial drift overlies the Greenfield Dolomite. The drift consists mainly of silt and clay, and also contains lenses of lacustrine beach sands. Ten to twenty feet of lacustrine sediments consisting mainly of silt and clay overly the glacial till (URS WC Diamond).

Methods

In order to satisfy the survey purposes, Enviroscan completed a multi-technique geophysical survey on December 3, 2002. The principles, methods, and results for each survey technique are detailed below.

Boring Clearance

The utility survey was completed using standard and/or routinely accepted practices of the geophysical industry and equipment representing the best available technology, including:

- a Fisher TW-6 electromagnetic (EM) pipe and cable locator/tracer;
- a Fisher FX-3 magnetic (MAG) locator;
- a Radiodetection C.A.T. and Genny pipe and cable locator/tracer;
- a Radiodetection RD4000 Multi-Frequency pipe and cable tracer; and
- a GSSI SIR-2000 ground penetrating radar (GPR) system.

TW-6

In order to detect and trace underground utilities, Enviroscan employed a Fisher TW-6 pipe and cable locator/tracer. In pipe and cable search mode, the TW-6 is essentially a deep-sensing metal detector that detects any highly electrically conductive materials (e.g. metals) by creating an electromagnetic field with a transmitting coil. A receiving coil at a fixed separation from the transmitter measures the field strength. As the instrument is swept along the ground surface, subsurface metallic bodies distort the transmitted field. The change in field strength/orientation is sensed by the receiver, setting off an audible alarm and causing deflection of an analog meter. The TW-6 can nominally detect a 2-inch metal pipe to a depth of 8 feet and a 10-inch metal pipe to a depth of 14 feet. In pipe and cable tracing mode, the TW-6 transmitter can be coupled directly (conductively) to exposed portions of a metallic pipe, cable, or wire or inductively to a subsurface metallic utility with known location and orientation. The transmitter remains stationary and energizes or excites the metallic utility to be traced with an 81.92-kilohertz signal that can be traced at the ground surface using the mobile TW-6 receiver wand or probe. In addition, approximate depths to metallic utilities can be determined using inductive or conductive mode triangulation.

C.A.T. and Genny

The survey areas were also scanned with a Radiodetection C.A.T. and Genny pipe and cable locator and tracer. In Power mode, the C.A.T. detects the 50 to 60 Hertz (Hz) electromagnetic field generated by live power cables and other metallic utilities to which a live line is grounded. In Radio mode, the C.A.T. detects buried conductors (cables or metallic pipes) as they conduct and re-transmit commercial broadcast radio energy. In Genny mode, the C.A.T. detects signal generated by the Genny transmitter. The Genny transmitter can be coupled directly (conductively) to exposed portions of a metallic pipe, cable, or wire or inductively to a subsurface metallic utility with known location and orientation. In addition, the C.A.T. can be used to track a miniature, waterproof sonde or "mole" inserted into any accessible pipe by a variety of means – including floating it down a fluid-filled pipe (often called "pigging"), pushing it through the pipe with flexible fiberglass rods (typically limited to approximately 200 feet of insertion), or hand-carrying it through an evacuated pipe (with proper confined space entry controls).

RD4000

Utility tracing was also conducted using a Radiodetection RD4000 digital cable and pipe tracer and transmitter. Similar to the TW-6 and C.A.T./Genny, the transmitter can be directly coupled to exposed portions of a metallic pipe, cable, or wire or indirectly (inductively) to a subsurface metallic utility of known location/orientation. The transmitter remains stationary and energizes the metallic utility at a frequency selected by the operator (512 Hz, 8 kHz, 33 kHz, or 65 kHz), which is received at the ground surface by the RD4000 receiver. When the transmitter is coupled directly to the metallic utility, the RD4000 digital receiver can also calculate the depth of the utility to an accuracy of $\pm$10% of the actual depth of the utility. Please note the close proximity to bends in the traced line or poor signal strength can result in erroneous depth estimations. The RD4000 can also trace a "mole" in the same fashion as the C.A.T., as described above.

FX-3

Enviroscan also employed a Fisher FX-3 magnetic locator. The FX-3 contains two sensors that measure the difference in total strength of the earth's magnetic field between two fixed heights above the ground surface (i.e. the magnetic gradient). In the absence of artificial magnetic fields or buried ferromagnetic objects, the natural gradient of the earth's field is relatively constant. Where buried magnetic or ferromagnetic objects (e.g. magnetite or iron respectively) are present, the gradient varies rapidly as the instrument is swept along the ground surface, triggering an audible alarm. The MAG instrument employed for this survey can nominally detect a 2-inch steel pipe to a depth of 4 feet.

Mr. Reitz
December 30, 2002
Page 4

GPR

GPR systems produce cross-sectional images of subsurface features and layers by continuously emitting pulses of radar frequency energy from a scanning antenna as it is towed along a survey profile. The radar pulses are reflected by interfaces between materials with differing dielectric properties. The reflections return to the antenna and are displayed on a video monitor as a continuous cross section in real time. Since the electrical properties of metal are distinctly different from soil and backfill materials, metallic pipes and other structures commonly produce dramatic and characteristic reflections. Fiberglass, plastic, concrete, and terra-cotta pipes and structures also produce recognizable, but less dramatic reflections. Scanning was performed using a GSSI SIR-2000 GPR controller with an internal hard drive and a color display, and both a high-frequency, high-resolution 500 megaHertz (MHz) antenna or transducer, and a lower frequency, deep-penetrating 200 MHz transducer.

Please note that onsite testing indicated that GPR penetration depth was severely limited over most of the site due to metallic reinforcing in the numerous concrete pads, as well as possibly electrically conductive soils and/or fill material underlying the site. In certain cases, GPR was of limited use in the tracing of utilities of a known orientation.

Borehole Logging

Borehole logging surveys involve recording and analyzing continuous or interval measurements of physical properties of soils and/or rock penetrated by wells. To perform the logging survey, Enviroscan collected the information using a Robertson Geologging (RG) SmartWinch and Micrologger II connected to a laptop computer running RG WinLogger software. The sondes mobilized for this survey included (please note that due to site-specific conditions some of these sondes were not utilized):

- ***Forward Digital Color Video:*** Records a visual inspection of the casing and/or borehole walls, allowing identification of construction type, screened intervals, obstructions, voids, obvious water bearing zones (based on visible infiltration, bubbles, silt movement, etc.) and fracture locations, as well as a semi-quantitative estimation of fracture orientation (if applicable).

- ***Natural gamma (γ)***: Records primarily the clay content of the formation (even through steel casing and in a dry hole), and can therefore detect potential aquitard layers.

- ***Single Point Resistance (SPR)***: Records relative (rather than absolute) electrical resistance of the formation(s) — which may be low in clays and progressively higher in silt and sand (requires water-filled hole and cannot be run through steel casing).

- ***Spontaneous Potential (SP)***: Records spontaneous electrical currents flowing in the groundwater due to movement of high total dissolved solids (TDS) or ionic water, or to contacts between clayey vs. sandy horizons (requires water-filled hole and cannot be run through steel casing).

- ***Fluid Temperature (T)***: Records water temperature. Since water flowing into or out of a well at a water-bearing zone disturbs the natural geothermal gradient of the water column, the locations of water-bearing zones and the sense of water movement (i.e. into vs. out of the boring) can often be determined (requires water-filled hole).

- ***Fluid Conductivity***: Records electrical conductivity of water, and can identify and discriminate between different water-bearing zones if the TDS or ionic content of the water in the two zones is different (requires water-filled hole).

- ***16"/64" Normal Resistivity:*** Records apparent electrical resistivity of the formation, and can therefore detect water-bearing fractures which represent zones of elevated electrical conductivity (relative to intact/impermeable resistive bedrock) or discriminate between sand, silt and clay sediment layers (requires water-filled hole and cannot be run through steel casing).

The logging data were collected in the upward direction (i.e. from the base of the well towards the ground surface). The logs began at 74 feet and continued to a point approximately 7.24 feet below the top of the riser pipe to accommodate the length of the sonde. The downhole camera was lowered, and data recorded, from the top of the riser to 74 feet.

Results

Boring Clearance

Enviroscan first traced the locations of all evident utilities with visible valves, meters, or service connections within or adjacent to the survey areas. These visible utilities were energized and traced using either the Fisher (TW-6 and FX-3) or Radiodetection (C.A.T. and Genny and RD4000) equipment.

The survey area was then scanned to locate non-evident utilities. Scanning for non-evident electric lines was conducted using the C.A.T. in Power mode. Searches for other non-evident utilities were conducted using GPR and the C.A.T. in Radio mode. Please note that the GPR investigation depth was severely limited, possibly due to local (conductive) fill material, as described above. Enviroscan then placed the proposed boring locations in an area free of subsurface obstructions.

Utility traces in all areas were marked in the field as the survey progressed using semi-permanent pavement paint and/or labeled flagging. Field markings were noted and the locations of nearby fixed landmarks were digitally recorded using a backpack-mounted Trimble Pathfinder global positioning system (GPS). This information is stored at Enviroscan, Inc. In addition, please note that the accuracy of the utility tracing techniques employed for this survey can vary based on many site-specific subsurface conditions (e.g. soil composition, utility geometry and construction, etc.). Therefore, Enviroscan recommends that borings or excavations honor the 18-inch clearance zone for marked utilities and a 3-foot clearance zone for multiple utilities/duct banks, as specified by Ohio One Call.

Borehole Logging

Initial site inspection showed that the deep (approximately 420 feet.) well was still occupied by the well head and pump apparatus. Arrangements by the client could not be made in time for this apparatus to be removed for logging of the deep well to take place during this survey. The remaining well was thought to be approximately 74 feet deep and steel cased for most of that depth. The camera also showed a total of approximately ten feet of water in the well. The axial camera was utilized first and showed that the 74-foot well was indeed cased for most of its depth. A videotape of the camera log is included with this report. Please note that depths relative to each other in the log are accurate; however, depths displayed on the videotape screen are incorrect due to operator error during the logging set-up. The presence of steel casing for the majority of the well length precluded the use of any of the EM sondes (SP, SPR, Fluid conductivity, 16"/64" Resistivity). The short water interval (10 feet, noted above) was not long enough for use of the fluid temperature sonde; therefore, that sonde also was not utilized. The results of remaining logs – natural gamma and caliper – are displayed on Figure 1.

The caliper results are consistent with an 8" casing to a depth of 72 feet, with an additional 2 feet of uncased borehole. The natural gamma results show three distinct layers. The first 51 feet are likely unconsolidated fill and or glacial drift. The middle layer, between 52 and 61 feet, appears to be a clay-rich layer of fill or drift. The third and deepest layer (61-74 feet) is consistent with limestone or dolomite, possibly the Greenfield Dolomite. Please note that these interpretations are limited due to the fact that only natural gamma data could be collected; with no correlation to other types of logs, the lithologies are only speculative.

Limitations

The geophysical survey described above was completed using standard and/or routinely accepted practices of the geophysical industry and equipment representing the best available technology. Please also note that the survey data are based on site conditions at the time of the geophysical investigation. Enviroscan does not accept responsibility for survey limitations due to inherent technological limitations or unforeseen site-specific conditions. However, we make every effort to identify and notify the client of such limitations or conditions.

As always, we appreciate this opportunity to have worked with you again. If you have any questions, please do not hesitate to contact the undersigned.

Sincerely,
Enviroscan, Inc.

William E. Steinhart III

William E. Steinhart III, M.Sc.
Geophysics Project Manager

Technical Review By:
Enviroscan, Inc.

Felicia Kegel Bechtel, M.Sc., P.G.
President

enc.: Figure 1: Geophysical Logging Data

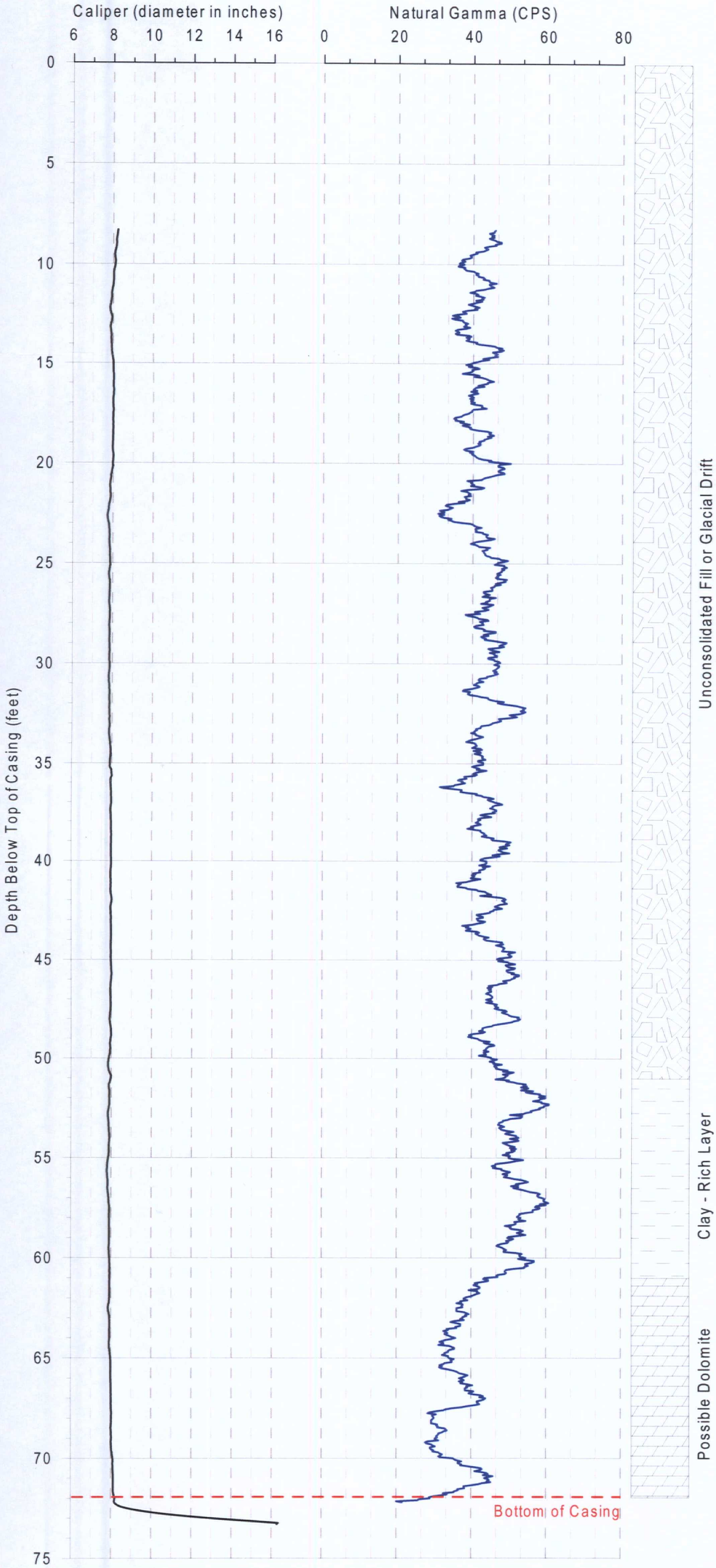

Figure 1

Geophysical Logging Data

DuPont Automotive Parts Plant
Toledo, Ohio

Enviroscan, Inc.
Project No. 090204c
Rev. 12/19/02

ENVIROSCAN, INC.

Notes:

Logging data were collected using Robertson Geologging Smartwinch and Micrologger II operating with Robertson's WinLogger software.